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OBSERVATIONS ON THE MARROW OF THE BONE AND THE SPLEEN IN A CASE OF LEUKÆMIA.[1]

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In the following paper attention will be called to some observations made upon the structural changes in the marrow and in the spleen and to the bearing they may have on the process of cytogenesis. Unfortunately, it has not been possible to study this process in the normal organs from the point of view suggested in the paper.

The case was one of leukæmia, treated in the Philadelphia Hospital under the care of Dr. William E. Hughes. The case was diagnosed as one of splenic and myelogenic leukæmia.

The notes of the *post-mortem* are as follows:

Isaac L., aged fifty-five years, white, male, native of England, admitted to the Philadelphia Hospital, December 11, 1894; died February 5, 1895. Post-mortem made sixteen hours after death.

Pathological Diagnosis.—Anæmia; hyperplasia of the spleen; lymphoid marrow of the bones; lymphoid infiltration of the liver and the kidney.

Body of a very emaciated man. Surface of the body considerably discolored by freezing, but showing evidences of a slight yellow discoloration. Round, superficial ulcers are found over the external malleoli.

Abdominal Cavity.—The liver projects beyond the edge of the thorax four centimetres in the right mammary line, ten centimetres in the median line, and four and a half centimetres to the left of the same. The spleen projects nine and a half centimetres in the left mammary line, and extends two and a half centimetres beyond the median

[1] Read before the Association of American Physicians, 1895.

line. The left lobe of the liver overlaps the spleen one centimetre. The appendix projects inwardly, and then bends down over the psoas muscle into the pelvis.

Thoracic Cavity.—The lungs are free and small, and the pleural cavities are empty. The costal pleura is marked by minute spots of dark pigment in the intercostal spaces. A few of these are found also in the mediastinal pleura. On opening the pericardial sac a dense band of adhesion is found in front. The right ventricle is covered by a large, white fibrous patch. The rest of the visceral pericardium shows evidences of myxomatous change.

Heart.—Both ventricles are flabby. The left cavities contain a small amount of liquid, pale, rose-colored blood and some grayish coagula. The mitral orifice admits two fingers. The right cavities contain a large, soft, grayish clot and a small amount of liquid blood. The tricuspid orifice admits with difficulty three fingers. The right auricle is somewhat dilated. The other cavities are normal in size. The mitral valve is slightly thickened and presents a few opacities. The other valves are normal. The apices of the papillary muscles show some evidences of fibroid change. The aorta presents some patches of atheroma near the valves. The myocardium presents a brownish color. The orifice of the pulmonary artery measures ten and a half centimetres in circumference. The pulmonary valves appear somewhat large. The aortic orifice measures nine and a half centimetres in circumference. The heart weighs three hundred and ten grammes.

Left Lung.—This presents extensive anthracosis. The surface of section is otherwise normal. The bronchial glands are of normal size, and some of them are slightly indurated and surrounded by a thickened capsule. Others are rather soft. They are all black in color. The lung weighs four hundred and sixty grammes. The right lung is similar to the left. The bronchial mucous membrane of both lungs is somewhat swollen, and presents a marble discoloration of a purplish and gray color. The organ weighs six hundred and eighty grammes.

Spleen.—The splenic vein flattened out measures one and three-tenths centimetres in diameter, and the artery half a centimetre. The organ is large, dense, and irregularly tongue-shaped, the upper extremity being thick and rounded and the lower extremity presenting a flattened edge. It presents a large concavity towards the hilum. There is a large notch on the posterior border and a smaller one on the anterior. The organ measures twenty-five centimetres in length, fourteen in width, and ten in thickness. At the upper end there is some thickening of the capsule. The latter presents a pale-magenta color. The surface of the section is smooth, and shows the color of cherry wood. There is no prominence of the Malpighian bodies. Towards the cortex the structure is slightly translucent, and very minute areas of a darker color and slightly translucent are seen throughout the substance. There is no prominence of the trabecula. The organ weighs eighteen hundred and ten grammes.

The *suprarenal bodies* are soft and dark in color. The connective tissue around them shows evidences of mucoid change.

The *left kidney* is rather soft, the capsule is easily removed, and the surface is smooth and grayish brown in color. The surface of section shows a marked contrast between the pyramids and the cortex. The former are of a rose-red color, and the latter is gray. The structure of the latter is not clear. The organ weighs one hundred and forty-eight grammes. The right kidney presents a similar appearance to the left, and weighs one hundred and forty-eight grammes. They both show some reduction of the cortex. The color of the latter may be compared with that of dark coffee and milk.

The *pancreas* is somewhat firm, and presents a pale yellowish-gray color. It is otherwise normal.

The *stomach* is rather contracted. The mucous membrane is smooth and presents a pale rose-color.

The *duodenum* is normal. The common duct is patulous. The bile is fluid and of a pale-yellow color.

The *liver* is rather soft, and the capsule presents a few patches of thickening. The color is of a rather pale brown, presenting in some portions minute mottlings of a yellowish-gray color. The organ measures transversely twenty-five centimetres. The right lobe measures antero-posteriorly twenty-two centimetres, and the left lobe nineteen. The right lobe is nine centimetres thick. The surface of section is smooth, brown, and marked by minute grayish areas in the periphery of some of the acini. The organ weighs nineteen hundred grammes.

The *mesentery* contains a small amount of fat showing mucoid change. The mesenteric glands are very slightly enlarged, of normal consistency, and some of them on section present a marbled appearance of white and rose-color. The inguinal glands are similarly affected. No change is found in other lymphatic glands.

Intestines.—The valvulæ conniventes are prominent and œdematous. In some places they are stained with bile, and in others they show evidences of congestion. The large intestine is normal.

The *abdominal aorta* is large and presents a few patches of atheroma, especially in the lower portion. It contains puriform clots. The thoracic duct presents a normal calibre and rather thin walls.

The *testicle* is rather soft, and presents striæ of a yellowish-brown and rose-red color.

The *bladder* is normal.

Bones.—The sternum presents a brownish-purple and pulpified marrow. The costal cartilages present, on section, a marked translucent brownish central area. The medulla of the femur is rather soft and dark purple in color.

The sections of the marrow and of the spleen that have received careful attention in this case were cut from small pieces that were placed for two hours in Müller's fluid, then washed, fixed in Fleming's, hardened in alcohol, and cut in celloidin. The methods of staining were safranin, Benda's hæmatoxylin stain, which was used for tissue that had been hardened in Müller's fluid, Biondi's fluid, and a stain of safranin, orange G, and methyl-blue.

Any one undertaking the study of these two organs recognizes at once the difficulty of the problem before him. The variety of opinions expressed as to the nature of the cellular elements is rendered more confusing by the variety of methods that are suggested for their study. No attempt will be made in the present paper to enumerate and discuss these opinions. In the bone-marrow especially we are confronted with cells that are diplasmatic to a marked degree. We have here in the loose reticulum, which has a tendency to arrange itself in the form of tubes, cells of varying size. Some of them contain fat, others hæmoglobin, others eosinophile granules, others present an osseous protoplasm, and others the colorless protoplasm of the amœbocytes. A rather ineffectual attempt to dissociate these cells is based upon peculiarities of the nucleus, even before the protoplasm becomes characterized by the different forms of metaplasma. The manner of division of the nucleus is insisted upon as an important feature in the differentiation of these cells. It is very probable, however, that different forms of nuclear division may be found in cells that are not fundamentally distinct from one another.

In the present case the lymphoid reticulum of the bone-marrow is found slightly thickened, and spaces are crowded with a variety of cells. These may be seen in Figs. 1, 2, and 3, accompanying the present paper. Attention is especially called to Figs. 1 and 2, where different forms of nuclear division and a variety of cells are shown. Nowhere in the marrow has any evidence been found of the formation of red blood-cells. There are, undoubtedly, numbers of cells that present the nuclear features that are said to be characteristic of erythroblasts, but it appears that they become overgrown with protoplasm, or may present evidences of nuclear cell-division without being able to form red blood-globules. The protoplasm of such cells frequently shows unmistakable evidence of the presence of hæmoglobin. In Fig. 1 a widely-dilated endothelial channel is shown filled with such cells. Their nuclei present the indirect forms of segmentation of the nucleus that have been described by Arnold. There are evidently no karyokinetic figures. In Fig. 2 a large marrow-cell is seen to the left, presenting a similar polymorphous arrangement of the nucleus. The nucleus of this cell presents a small amount of chromatin and a distinct nuclear membrane. To the right of this we find an erythroblast which shows swelling of the protoplasm and increase in the amount of chromatin and an attempt at mitotic division of the same. Such cells are frequently found in the marrow in the present case, and undoubtedly find their way into the circulation and swell the number of leucocytes and nucleated red blood-cells. The next cell to the right is a resting-cell of the same kind as the one to the left, but in which no fragmentation is taking place. We have, finally, to the right of this a large fat-cell. In fact, in these wide channels of the lymphoid marrow we may find cells in all stages of direct nuclear fragmentation and varying forms of chromatolysis, and cells varying in size from the small round erythroblasts (that will be described further on) to the large cells shown in Figs. 1 and 2. With the exception, perhaps, of the true erythroblasts, these cells may be considered as interchangeable, and even the erythroblasts appear to be subject to such changes as may bring about their conversion into the form of cell described as leucoblast,—that is, their nucleus may become gradually poorer in chromatin, and will assume by degrees the loose reticulated appearance characteristic of the larger cells.

In regard to the spaces where these cells are to be found in the bone-marrow we note the fact that many of them are not lined with endothelial cells. Some of them, on the other hand, present the endothelial lining of capillaries. These endothelial cells show no evidences of nuclear cell-division. They are oval in shape, poor in chromatin, and project slightly into the lumen of the vessel. These endothelial channels appear to be surrounded by channels that are not lined with endothelial cells. It is in these periendothelial channels that we shall find, later on, in the spleen, a large number of erythroblasts engaged in the process of red blood formation. In the marrow of the bone, however, they do not gather in these localities,

FIG. 1.

Bone-marrow of leukæmia; large irregular nuclei, with hæmoglobin protoplasm. Compen. oc., No. 4. Apo. oil imm., 2 mm.

FIG. 2.

Bone-marrow of leukæmia. *a*, large polymorphous nucleus with hæmoglobin protoplasm; *b*, large erythroblasts with imperfect mitotic division of the nucleus; *c*, fat-cell. Compen. oc., No. 4. Apo. oil imm., 2 mm.

FIG. 3.

Bone-marrow of leukæmia; *a*, true erythroblasts surrounded by a mass of protoplasm containing hæmoglobin. Compen. oc., No. 4. Apo. oil imm., 2 mm.

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and therefore fail to contribute to the formation of red blood-cells. This is true at least of the present case of leukæmia.

I wish to call especial attention to the cell marked with the letter *a* in Fig. 3. The two nuclei represented in this cell are surrounded by a transparent zone. The nuclei are homogeneous and stain intensely red with safranin. It will be seen later on that bodies similar to these nuclei are especially concerned in the formation of red blood-cells. Cells similar to the one marked with the letter *a* are found containing even a larger number of nuclei. These may be separated as in the present instance, or they may be joined together by filamentary prolongations. The protoplasm around them contains hæmoglobin. These cells undoubtedly represent ineffectual attempts at the formation of red blood-cells. As will be seen when we come to study the spleen, the successful formation of erythrocytes seems to take place only from free nuclei similar to those found within this mass of protoplasm. It will be seen, furthermore, that the successful formation of red blood-cells takes place only in contact with endothelial cells, and, in the present case, only in the spleen. We should not fail to notice the marked difference that there is between the cell at present described and the one containing pale nuclei. The nuclear filaments that may be found joining the fragments of the nucleus in the latter cells are pale and usually thick, whilst the filaments of the multinuclear erythroblasts are stained intensely red and are very fine. I should mention here that when the triple stain of safranin, orange G, and methyl-blue is used, the pale nucleus of the so-called leucoblasts takes a greenish color, whereas the homogeneous nucleus of the erythroblasts, whether found free or within the protoplasm of large cells, takes the red stain of the safranin. In fact, the orange G acts as a decolorizing agent, removing the safranin stain from all the structures except the erythroblastic nuclei. In the upper part of Fig. 3 a few cells are shown presenting the greenish stain in contrast with a few homogeneous small nuclei stained red. The appearance of structure in some of these red nuclei will be noted later on.

We find also in the bone-marrow a large number of cells, each of which contains a large vacuole and presents a few granules of fat in the protoplasm around the vacuole. These are evidently fat-cells from which the infiltrated fat has been removed.

Red blood-cells of various shapes are found in the channels of the marrow together with the cells above described. Many of them are very pale, and some of them are nucleated red blood-cells. We find nowhere any clear evidence of pigmentary degeneration of these cells.

In the spleen we find a general increase of the connective-tissue reticulum. We find here, as in the marrow, a number of parallel channels, some of them lined with endothelium and others not. The latter are frequently crossed by fibrillar prolongations of the reticulum. The nodes of the latter present here and there stellate connective-tissue cells and occasionally a flat endothelial cell with a slightly projecting pale oval nucleus.

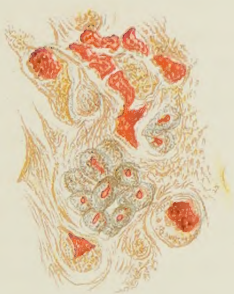
These spaces contain cells similar to those that have been described in the bone-marrow. The number of red blood-cells, however, is greater, as is also that of the free nuclei that we shall describe here as true erythroblasts. These are most numerous in the immediate vicinity of the channels that possess a distinct endothelial wall. These will be considered as capillaries. The point that I wish particularly to call attention to is the behavior of the erythroblasts in the immediate neighborhood of the endothelial channels. It is here that we see for the first time anything like the formation of red blood-globules. The process is something as follows:

The small free erythroblast sends a prolongation of varying length through the endothelial wall, from without towards the interior of the vessel. This prolongation just within the endothelial lining swells into a bud which may be smaller or larger than the erythroblast from which it springs. This small bud presents the same peculiarities as the erythroblast outside. It is around this bud that we see the formation of the red blood-cells. These seem to grow around the bud as a protoplasmic formation around the nucleus, except at the point of contact with the filament. If the bud presents a round shape, the hæmoglobin-holding protoplasm is also globular. If the bud is pear-shaped, the protoplasm generally presents the same outline. Occasionally the protoplasm grows more from one side of the nucleus. The union between the erythroblast and the bud may be very close, presenting the appearance of a large diplococcus divided by a line of endothelial membrane. In other cases the filamentary union may be as long as nine μ. In some cases the bud has been evidently broken off, or has not formed, and the end of the filament can be seen pointing in the endothelial wall. When the bud-cells, with their hæmoglobin envelope, are disengaged from the endothelial wall they constitute a nucleated red blood-cell. As some of these nuclear buds are found of very small size, with a large blood-cell around them, it is very probable that the latter may be loosened from its anchorage without any nuclear contents, thus constituting a fully-developed red blood-cell. There is also evidence that the bud may be loosened from its moorings without any hæmoglobin formation about it. In this case it constitutes, it appears to me, a true blood-plaque. The measurements of one of these buds give for the red homogeneous nucleus within the endothelial channel three μ in diameter, the red body outside of the endothelial channel measures two μ in diameter, the filament between them one μ, and the hæmoglobin capsule five and a half μ. Another one in the same capillary presents a bud of one and a half μ in diameter and a hæmoglobin capsule of six μ. The filament penetrates the endothelial wall for a distance of two μ. Here it has evidently broken off in the preparation. The outline of the hæmoglobin envelope is generally globular, and the protoplasm is slightly granular and yellow. In another capillary we find the following evidences of budding. First, a homogeneous red body three and a half μ in diameter in close contact with the external surface of the endo-

FIG. 4.

Capillary of leukæmic spleen, showing budding of erythroblasts through the endothelial wall. Three specimens are shown in the upper wall. Compen. oc., No. 4. Apo. oil imm., 2 mm.

FIG. 9.



Sporoblast-like body. Compen. oc., No. 4. Apo. oil imm., 2 mm.

thelial wall, through which it sends a tip-like projection one and a half μ long by one μ wide. This is capped within the blood-vessel by a pear-shaped red blood-cell very slightly larger than the erythroblast without. Next to this there is an endothelial nucleus, and just beyond it another filamentary figure (Fig. 5, *a*) with the following dimensions: Outside of the endothelial channel there is a round, intensely red, homogeneous body. This body measures nearly three μ in diameter. There is no protoplasm about it. From this body a fine filament, slightly bent upon itself, extends a distance of six μ to a similar red body just within the endothelial line. The fine filament expands slightly as it goes through the endothelial wall, thus giving something of a pear-shape to the body within the endothelial channel. The latter body is equal in diameter to the one outside. The hæmoglobin capsule springs from one side of this body and is somewhat oval in shape, measuring three by three and a half μ. A small portion of hæmoglobin protoplasm is also seen projecting from the opposite side of the endothelial bud. Further on we find (Fig. 5, *b*) a pear-shaped red body close to the endothelial lining, with a point embedded in it. This is continued into a short filament somewhat bent upon itself, and terminates in a similar pear-shaped body within the endothelial channel. Springing from this we have a pear-shaped red blood-cell measuring about six μ in diameter; next to this there is a closely-joined couple of pear-shaped bodies. All these are found upon the same side of the capillary within a distance of fifty μ. This process of filamentary budding never takes place through the endothelial nucleus, but through the cement or the protoplasm of the flat endothelial plate.

There are several reasons to support the view that these filamentary buds project from without to the interior of the capillary. They are as follows:

1. We always find an absence of hæmoglobin around the erythroblast outside of the endothelial channel. It is reasonable, then, to suppose that the globule acquires its hæmoglobin envelope after it penetrates the endothelium and comes in contact with the circulating plasma.

2. We find in the majority of instances that the body outside of the endothelial channel is larger than the one within.

3. We find also evidences of progressive chromatolysis in the bud, usually in proportion with the growth of the hæmoglobin capsule. Sometimes there is nothing left but the point of the chromatin filament to which the red blood-cell is attached. The bud further shows evidences of dissolution by breaking up into minute filaments radiating for a short distance from the point of attachment. The latter change gives these corpuscles, with their filamentary tail, the appearance at times of spermatozoa.

The small, round erythroblasts are not always homogeneous. Some of them present, within the well-stained nuclear matrix, minute granules of a darker color. These are so arranged sometimes as to give the impression of mitotic figures. It is probable that they are such, but it is difficult to analyze them on account of the intense coloration of the matrix and the

close packing of the supposed mitons. In other cases we find within the erythroblast fine lines of a lighter color than the surrounding substance. In such cases the chromatic substance appears broken up into four fragments by a pale crucial figure. The erythroblasts engaged in the process of filamentary budding are homogeneous, except that occasionally, as previously mentioned, the bud breaks up into small rays extending a short distance into the red blood-cell. Erythroblasts that are not engaged in the process of filamentary budding are frequently of a larger size. In these a densely packed coil of chromatin may be seen, and sometimes a rearrangement of the miton in obscure karyokinetic figures. I am of opinion that in such cells the nuclear matrix may swell before the nucleus divides, and the cell is thus converted into the so-called leucoblast.

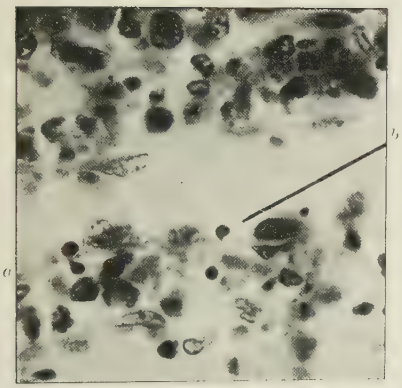
Though the splenic channels, endothelial or non-endothelial, are frequently crowded with red blood-cells of varying shape, we find very little evidence of pigmentary degeneration. The irregular distribution of these red blood-cells makes it difficult to decide upon the nature of the endothelial channels,—that is, as to whether they are or are not true capillary continuations of the blood-vessels of the spleen. In my opinion they are; but this question belongs to one of the many difficult problems in the histology of the spleen.

For purposes of comparison, the spleens of a case of cardiac anæmia and of progressive pernicious anæmia have been examined. In neither of these have the filamentary figures been found. It must be stated, however, that in the case of pernicious anæmia the tissues were not fixed in osmic acid, and that in the case of cardiac anæmia, though the attempt was made to fix the tissues by means of osmic acid, the result was not quite successful, evidently on account of post-mortem changes.

In the spleen of cardiac anæmia the number of red blood-cells in the spleen channels is very great. The endothelial cells show no evidences of division. They are, however, more numerous and more globular than in the cases of leukæmia. They project further into the endothelial channel. Sometimes they are very close together, leaving scarcely any space between them. The closer together they lie the more prominent and globular they appear. These endothelial nuclei measure between nine μ and twelve μ in length and five μ in width. The endothelial channels, besides containing frequently a large amount of hæmoglobin-cells, contain also a few leucocytes. The majority of them are multinuclear, and many of them contain fat-granules in their protoplasm. Occasionally we find an erythroblast nucleus in the interior of a protoplasmic body containing hæmoglobin. These are not found in endothelial channels. Free erythroblasts are also numerous.

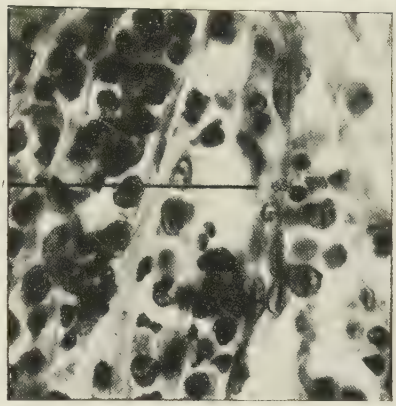
In the case of pernicious anæmia the endothelial nuclei are still more swollen and numerous than in the case of cardiac anæmia. The capillary spaces are evidently dilated. In both the spleen and marrow we find distinct evidences of pigmentary degeneration of the red blood-cells. We

Fig. 5.



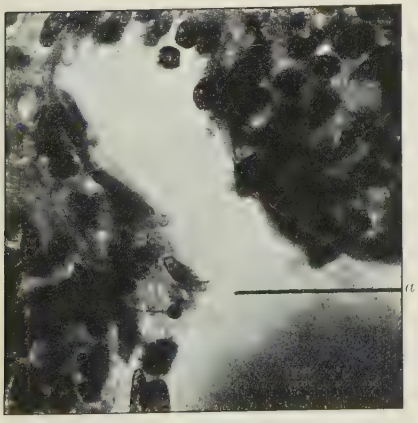
Capillary of spleen, described in detail in the paper. *a* and *b* indicate erythroblasts in process of filamentary budding. Case of leukæmia. Project oc., No. 2. Apo. oil imm., 2 mm.; camera length, 85 cm.

Fig. 6.



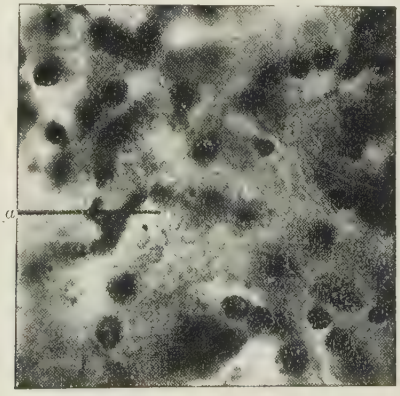
Section of leukæmic spleen, showing erythroblasts in process of budding. Minute bud within the endothelial channel surrounded by a hæmoglobin envelope. Project oc., No. 2. Apo. oil imm., 2 mm.; camera length, 85 cm.

Fig. 7.



Long filamentary budding in endothelial channel. Project oc., No. 2. Apo. oil imm., 2 mm.; camera length, 85 cm.

Fig. 8.



a, sporoblast-like body, bone-marrow of leukæmia. Project oc., No. 2. Apo. imm., 2 mm.; camera length, 85 cm.

also find, especially in the marrow, rows of fat granules in the endothelial lining of the vessels. These rows are generally discrete, and sometimes they bifurcate, leaving the nucleus in the middle. The number of erythroblasts is smaller in these organs than in those of leukæmia. The same may be said of the number of eosinophile cells.

As to the origin of the erythroblasts, the opinion is maintained in the course of the paper that all the cells described may develop one from the other through a species of metaplasia, the starting-point of which is probably the lymphocyte. The erythroblast appears to originate in the shape of spherical fragments of chromatin that are thrown off from the nuclei of other cells; and the latter may again develop from the erythroblasts by a process of chromatolysis and swelling of the nuclear matrix. I do not pretend, however, to insist upon this point. The opposite view, that gives the erythroblasts a specific character and traces their origin to embryonal red blood-cells, is also well supported.

My object in this paper has been to call attention to the process of filamentary budding of erythroblasts through the endothelial wall as a factor in the formation of red blood-cells. It is very improbable that this process should occur in the leukæmic spleen and not under normal circumstances.[1]

Figs. 4, 5, 6, 7 show capillaries of the spleen in which the process of filamentary budding manifests itself. Fig. 5 has been described in the text. In Fig. 6 a couple are shown in which the endothelial bud is of very small size and shows evidences of breaking up into indistinct filaments within the red blood-cell. This figure shows an arrangement of the parts that is frequently met with,—namely, that the endothelial channels are much narrower than the non-endothelial channels around them. Fig. 7 shows a very long filamentary bud. In Fig. 4 a capillary is shown, in the upper border of which three filamentary buds are forming.

Figs. 8 and 9 represent peculiar bodies found in the marrow of the case of leukæmia. It is impossible to account for these either by supposing them to be forms of degeneration of the nucleus or groups of red blood-cells. They resemble somewhat a sporoblast formation. By careful focussing the group is found to consist of nine cyst-like bodies, each one of which measures three or four μ. They are vesicular in structure and present a rod-shaped body lying near the periphery of the vesicle. The vesicles take a pale reddish-gray color with safranin, and the rod-shaped body stains intensely red. A considerable number of these are found in the marrow of the case of leukæmia. They may be found in groups of twos and threes; the one represented in Fig. 9 and reproduced from a photograph in Fig. 8 is the largest and most distinct of these groups that I have found. It is possible that these may be indications of the so-called "vesicular degenerations" of the nucleus, or that they

[1] Since the reading of this paper I have found the same process in the spleen of the rat, and of the rabbit, after hemorrhage.

might be red blood-cells of small size presenting some change in their wall which leads to the appearance of the rod-shaped nucleus. It must be admitted, however, that these explanations are not satisfactory, and that the nature of these bodies must be left in doubt until opportunity is given for a more complete investigation.

OBSERVATIONS OF ANTITOXIN IN DIPHTHERIA.[1]

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During the past nine months I have had the opportunity of observing an extensive and thorough trial of antitoxic serum in the treatment of diphtheria, and I have thought that a brief account of my observations might be of interest to the members of this society. All of the cases were seen in the service of one institution, the Willard Parker Hospital of New York; the conditions, therefore, were the same in all. The series of cases is so large that it should aid us in arriving at a fair estimate of the value of diphtheria antitoxin, as well as of its limitations, when used in hospital practice.

The systematic use of antitoxin was begun in the Willard Parker Hospital at the commencement of the present year, though the serum employed during the month of Jannary was, unfortunately, not strong enough to give the best results. Previous to this year dependence was placed upon the local and constitutional treatment which was in general use elsewhere before the introduction of antitoxin, and the results obtained compared very favorably with those in hospital practice in other cities of this country and Europe. All cases on entrance were irrigated with normal salt solution, and this irrigation was repeated every two hours or even every hour, until the nares were free from discharge or obstruction and the pharynx clear of membrane. Poultices were employed for the relief of glandular enlargement, and steam inhalations and calomel fumigations were in constant requisition to combat the onset of stenosis of the larynx. When these latter measures proved unavailing, intubation was resorted to, and, in a few instances, tracheotomy.

The general treatment consisted mainly of the administration of the tincture of the chloride of iron in large and frequent doses. Other tonics were used to meet special indications. Stimulants were not employed as a

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[1] Read by title at the meeting of the American Climatological Association at its meeting at Hot Springs, Virginia, 1895, and furnished for publication November 5, 1895.

matter of routine, but, when needed, were given freely, particularly in septic cases.

Under the treatment thus briefly outlined the mortality ranged from thirty to thirty-eight per cent., varying somewhat with the season of the year and the character of different epidemics.

The antitoxin treatment, as I have said, dates from the beginning of the present year. From the 1st of January, 1895, to the 1st of October, 1895, there were admitted to the hospital five hundred and ninety-three cases of diphtheria. All of these cases, with the exception of some ten or twelve, were given antitoxin on the day of entrance into the hospital. The local and general treatment of former years was not entirely abandoned, but it has become of secondary consequence. Cases are irrigated on entrance, and the irrigation is repeated from time to time until all membrane has disappeared. Calomel sublimation is still employed, but with much less frequency. The tincture of the chloride of iron is no longer given at all. Patients receive iron, but in smaller doses, and only when it is especially indicated. Intubation and tracheotomy are still required to relieve stenosis of the larynx, but a larger proportion of laryngeal cases recover without operative interference than under former methods of treatment.

Of the five hundred and ninety-three cases under consideration, four hundred and thirty-eight recovered and one hundred and fifty-five died, a mortality of 26.14 per cent.

During the same period of nine months in 1894, four hundred and sixty-nine cases were treated in the hospital, of which three hundred and four recovered and one hundred and sixty-five died, a mortality of 35.18 per cent., nine per cent. greater than that for the present year.

TABLE I.

MORTALITY IN WILLARD PARKER HOSPITAL DURING THE FIRST NINE MONTHS OF 1895 AND IN THE CORRESPONDING PERIOD OF 1894.

1895.

	Cases.	Deaths.	Percentage.
First quarter	156	52	33.33
Second quarter	256	75	29.29
Third quarter	181	28	15.47
Totals	593	155	26.14

1894.

	Cases.	Deaths.	Percentage.
First quarter	147	53	36.05
Second quarter	214	83	38.78
Third quarter	108	29	26.85
Totals	469	165	35.18

By referring to Table I. it will be seen that the reduction in mortality under the serum treatment began in the first quarter of the year, and became more and more marked as the year progressed. These improved results are probably due to the greater strength of the serum employed, as well as

to the more efficient dosage during the later months, the natural consequence of longer experience in its administration.

The simple statement that antitoxin lowers the death-rate in diphtheria does not enlighten us very much as to its exact value in different forms and stages of the disease. I have, therefore, analyzed our cases so that we can study them from the various stand-points. It is claimed that antitoxin acts as a specific in diphtheria when given on the first or second day of the disease, its value diminishing rapidly after the third day. The critics of the new treatment, on the other hand, assert that the older methods were also capable of controlling the disease if applied at its very beginning.

Table II. will show how far these respective claims hold good in the experience of the Willard Parker Hospital:

TABLE II.

DEATHS ACCORDING TO DAY OF DISEASE UPON WHICH TREATMENT WAS BEGUN.

1895.

Day upon which treatment was begun.	Cases.		Mortality percentage.	
First day	108		10.09	
Second day	130		25.19	
Third day	116		34.19	
Fourth day	87	355	31.82	33.8
Over four days	152		36.64	
Totals	593		26.14	

1894.

Day upon which treatment was begun.	Cases.		Mortality percentage.	
First day	43		26.67	
Second day	120		33.61	
Third day	111		35.40	
Fourth day	74	306	35.53	35.9
Over four days	121		36.29	
Totals	469		35.18	

According to this table, one hundred and eight cases were given antitoxin on the first day of the disease, and 10.09 per cent. died. In 1894, in the preantitoxin period, there were forty-three cases which came under treatment on the first day, and the mortality was 26.67 per cent., two and one-half times as great as in the cases treated with antitoxin. On comparing the two groups of cases which did not receive treatment until the second day of the disease, we again note a difference in favor of antitoxin. Here, however, the difference ends abruptly, the average death-rate in all cases treated after the second day being only two per cent. less in 1895 than in 1894. This table, then, though far from supporting the claim that antitoxin is a specific in diphtheria, apparently proves conclusively that the new treatment, when applied early in the disease, gives much better results than the older methods.

It has been apparent to all those in attendance at the hospital during the present year that fewer patients have presented the symptoms of sepsis than

in former years, and that, on the other hand, a much larger proportion have developed broncho-pneumonia at some period during their stay in the wards. With a view to elucidating these points I have prepared Table III., which gives the causes of death in 1894 and 1895, with the numbers dying of each cause, and the percentage of mortality from such cause in each year:

TABLE III.

CAUSES OF DEATH.

1895.

	Totals.	Percentage.
Broncho-pneumonia	66	53.22
Laryngeal stenosis	17	13.71
Sepsis	13	10.48
Heart failure	11	8.87
Pulmonary œdema	6	4.84
Paralysis	4	3.23
Nephritis	3	2.42
Bronchitis	2	1.61
Pulmonary gangrene	1	0.81
Meningitis	1	0.81
Totals	124	100.00

1894.

	Totals.	Percentage.
Broncho-pneumonia	24	16.90
Laryngeal stenosis	44	30.99
Sepsis	46	32.39
Heart failure	12	8.45
Pulmonary œdema	4	2.82
Paralysis	6	4.23
Nephritis	1	0.70
Bronchitis	2	1.41
Pulmonary gangrene	2	1.41
Meningitis	1	0.70
Totals	142	100.00

A case of diphtheria progressing to a fatal termination presents so many symptoms and complications that it may be very difficult to decide as to the determining cause of death. The above table, however, is compiled from the records of the hospital, which are based upon careful clinical study of each individual case, often supplemented by *post-mortem* examination.

NOTE.—This table only includes cases which died in the Willard Parker Hospital. A number of cases in each year developed symptoms of other infectious diseases, such as scarlet fever, measles, or varicella, and were transferred to the Riverside Hospital on North Brothers Island.

The great mortality from broncho-pneumonia during the present year is the most striking feature of the table, over one-half the deaths being attributed to this complication of diphtheria, whereas only one case in six died of this cause in 1894.

On the other hand, laryngeal stenosis and sepsis, which together caused sixty-three per cent. of the mortality last year, have proved fatal in less than twenty-five per cent. of the cases since the introduction of antitoxin. As I have already said, it had been noticed how few of the patients this year developed sepsis, while cases after cases showed the signs of broncho-pneumonia, particularly when apparently convalescent from the diphtheritic process. This late development of broncho-pneumonia has been one of the most disappointing features of our experience with antitoxin. Patients would be relieved of stenotic symptoms, either with or without intubation, only to die two, three, or even four weeks later of pulmonary complications. It should be said, however, that most of the deaths from broncho-pneumonia occurred in operative cases, and that there have been many more such cases this year than in 1894. An unusually large proportion of the patients entering the hospital had laryngeal symptoms on entrance. Many of these were apparently relieved by antitoxin, and of those who still required operative interference, a larger proportion recovered from the immediate effects of the operation than in former years. Could these patients have been protected from the later invasion of the streptococcus, the number of recoveries after intubation would have been very large.

The following table will show what difference, if any, there was in the duration of stay in the hospital of fatal cases of broncho-pneumonia, laryngeal stenosis, and sepsis in 1895 and 1894:

TABLE IV.

DURATION OF STAY IN HOSPITAL OF FATAL CASES OF BRONCHO-PNEUMONIA, LARYNGEAL STENOSIS, AND SEPSIS.

	1895.	1894.
Broncho-pneumonia	13.7 days.	2 days.
Laryngeal stenosis	3 "	2 "
Sepsis	3 "	2 "

According to the table, sepsis and laryngeal stenosis, when unrelieved, proved rapidly fatal in both years. The figures for broncho-pneumonia, however, are widely different in the two years. The two weeks' length of stay in the hospital of fatal cases in 1895 illustrates the late development of the disease to which I have referred above.

I have already intimated that, in my opinion, the great reduction in the mortality from laryngeal stenosis was, in large part, due to the administration of antitoxin, but I am in doubt as to whether or not the even greater falling off in the deaths from sepsis is to be credited to the same cause. It is the impression of Dr. Somerset, the resident physician, that very few cases of septic diphtheria entered the hospital during the present year. I have myself noticed, in my visits to the wards, the rarity of the hopeless hemorrhagic cases which were seen so frequently in preceding years. It will require a careful study of the records to determine whether the lessened

mortality from sepsis since the introduction of antitoxin is of any therapeutic significance.

The remaining causes of death in Table III. show a close correspondence in the two years, and call for no remark.

I had hoped to be able to present the exact comparative death-rate for 1894 and 1895 of laryngeal cases, both operated and non-operated, but I shall have to be satisfied for the present with the statement that the total mortality for intubation and tracheotomized cases in the present year is sixty-eight per cent., as compared with eighty-five per cent. in 1894.

It is my impression that the laryngeal cases which escaped operation show an even greater reduction in the death-rate from that for the previous year.

No study of the value of antitoxin in diphtheria would be complete without careful consideration of the age of the patients under treatment. Children under two years of age usually die in spite of all our efforts, whereas older children and adults will often get well without any treatment whatever. I have, therefore, classified our cases according to age, with the percentage mortality for 1895 and 1894:

TABLE V.

MORTALITY ACCORDING TO AGES OF PATIENTS.

1895.

	Cases.	Mortality.
Under 2 years	101	70.59 per cent.
2 to 4 "	129	41.54 "
4 to 6 "	101	19.61 "
6 to 8 "	66	14.93 "
8 to 10 "	30	3.23 "
10 to 12 "	24	4.00 "
12 to 14 "	28	0.00 "
14 to 16 "	19	0.00 "
Above 16 "	95	6.00 "
Totals	593	26.14 "

1894.

	Cases.	Mortality.
Under 2 years	89	67.02 per cent.
2 to 4 "	116	46.28 "
4 to 6 "	87	36.96 "
6 to 8 "	54	23.73 "
8 to 10 "	31	11.11 "
10 to 12 "	12	7.14 "
12 to 14 "	6	0.00 "
14 to 16 "	4	0.00 "
Above 16 "	70	4.00 "
Totals	469	35.18 "

Table V. indicates a lowering of the death-rate by the serum treatment in cases between two and twelve years of age. This accords with the

published experience of other hospitals. The unfavorable showing for antitoxin in cases over sixteen years of age is also in agreement with the observations abroad.

The increased percentage of deaths this year among cases under two years of age is, however, surprising and contrary to experience elsewhere. It is true that a large proportion of these cases came to the hospital in an advanced stage of the disease. Many also were laryngeal cases which required intubation or tracheotomy, and further analysis will probably show that broncho-pneumonia played a large part in determining the fatal issue.

The above statistical tables demonstrate fairly, I think, that diphtheria antitoxin has considerable therapeutic value, even in hospital practice, an admittedly poor field for a demonstration of its curative action. The same tables also point out the limitations of the new remedy to which I referred in the beginning of this paper. A reduction of nine per cent. in the mortality of diphtheria, or a saving of nine more lives in every hundred patients, is indeed a great gain, but a death-rate of twenty-six per cent. still remains to combat the claims of antitoxin as a specific in the disease. The chief reason, to my mind, why the experience of the Willard Parker Hospital is not more favorable is that the patients enter the hospital at such an advanced stage of the disease. We have seen in Table II. that only one hundred and eight cases of the total number of five hundred and ninety-three came under treatment on the first day of the disease. It is my own belief that the great majority of these one hundred and eight cases had been ill for two, three, or even more days when they were brought to the hospital. The clinical signs in the throat and the general condition were sufficient evidence of this in many cases. The testimony of parents of the class from which these patients came is but little to be depended upon. Whatever good results we have seen from the serum treatment are accomplished in the face of very great difficulties, and I am confident that in private practice among intelligent people the specific character of diphtheria antitoxin will be demonstrated. Welch, in his recent paper, has collected the reports of six hundred and sixty-three cases in private practice, with forty-six deaths, a percentage of only 6.9, almost exactly twenty per cent. less than the mortality of our five hundred and ninety-three hospital cases.

Before closing I wish to say a few words on the secondary streptococcus infection in diphtheria, with especial reference to the probability that we shall, in the near future, be in possession of a streptococcus antitoxin. We have seen how large a proportion of our cases died of broncho-pneumonia, a complication not due to the Klebs-Löffler bacillus, but to a distinct microorganism, the streptococcus. Could we have successfully antagonized this secondary infection, half of our deaths could have been avoided. This possibility appealed to me this last year with especial force whenever I saw the pulmonary complication develop in convalescents who perhaps were on the point of being sent home as well. I often longed for a recovery hospital,

so to speak, to which they might be sent to convalesce, free from the infection which must be present in the neighborhood of active cases of diphtheria, especially operated cases. But even this transfer might not save them, for Welch believes that the streptococci which are present in the normal throat are capable of setting up the pulmonary process in an individual already weakened by the effects of the Klebs-Löffler bacillus.

It is, therefore, most satisfactory to note the progress that has been made in the production of a streptococcus antitoxin.

It has long been believed that there are several varieties of streptococci, each of which is capable of producing distinct pathological effects. It is now claimed, however, by T. J. Bokenham, the late Research Scholar to the British Medical Association, that streptococci observed in connection with different pathological conditions are not distinct, botanically, from each other. If the culture conditions are changed the characters of the microbes become altered in many cases. By using for several successive generations the living tissues of rabbits, Bokenham has first obtained erysipelas, then later a pus production, and still later a general infection, very virulent in character, but with no evidence of either erysipelas or pus production. If the series be sufficiently prolonged, the streptococci become of such virulence that a fraction of a drop of the blood of an animal killed by them will set up an infection running a fatal course in a few hours. At the same time the cultural characteristics have become so changed that a bouillon culture of the microbe no longer resembles one of the original culture. The differences observed between streptococci obtained from different sources are not specific in character, according to Bokenham; they are accidental rather than inherent in the micro-organisms themselves. Therefore, Bokenham is convinced that for the preparation of a streptococcus antitoxin on the same lines as that of diphtheria, the source of the microbe is immaterial; the only necessity is that its virulence should be as great as possible. Unfortunately the streptococcus rapidly loses its virulence in the ordinary culture media. After long experimentation, Bokenham has finally found a satisfactory medium in a mixture of bouillon and asses' serum. He states that he has already succeeded in partially immunizing an ass so that its serum has some protective power. Similar experiments are being carried on in France and in Germany, and there is good ground for hope that we shall soon have an anti-streptococcic serum to supplement the anti-diphtheritic serum in the treatment of diphtheria and its complications.

THE GERM OF CHANCROID.

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THE question of the specificity of chancroid has disturbed the professional mind ever since Bassereau, in 1832, demonstrated the duality of chancre and chancroid. As is well known, even the observations of Bassereau were not universally accepted. Indeed, it is worthy of remark that such eminent men as Jonathan Hutchinson and Moritz Kaposi still pose as "unicists" in syphilography. Although many attempts have been made to demonstrate a specific germ in chancroid, and many germs have been discovered, it is nevertheless true that the most practical of our clinicians have held, with Bumstead, that chancroid is the product of some form of septic infection, developed under the favoring environment afforded by filth, local irritation, pathological and physiological discharges in a state of decomposition, moisture, and protection from air and light. Bumstead, to be sure, was unfamiliar with the germ feature of the condition which he described, yet his conclusions are made sounder by our more recent knowledge of germ-infection. The hypothetical virus taught by Bumstead is rendered intelligible by our modern views of bacterial evolution. Such men as Finger and Campana had not, up to the time of the Congress at Rome (1894), renounced views which were essentially those of Bumstead.

Among the early alleged discoveries of a specific germ in chancroid were those of Wood and Hallier in 1868, and Salisbury in 1873. These workers, following the lines laid down by Hausmann, Adam, and Deidier, in the latter part of the eighteenth century, professed to have settled the question by the discovery of a special form of germ which was undoubtedly the specific cause of soft chancre. Like their predecessors, these men failed to obtain recognition or, at least, acceptance of their views. Many researches have since shown that the poisonous properties of chancroidal secretion are quite similar to those of other septic fluids. Pasteur, Koch, Lestikow, Morrison, and Mannio have all made this observation, and have confirmed a view which is supported by clinical experience.

Many of the alleged discoveries of a specific chancroidal germ have been of organisms which are quite familiar to us in other *rôles* than that of a specific venereal germ. Thus, in 1885, Ferrari discovered a "specific" germ which was an ordinary saprophyte. As this germ was found in a chancroidal ulcer, the inference seems to have been that it was the *fons et*

origo of the disease. Later on, Lucca captured a microbe which the iconoclastic Gibert afterwards showed to be a pus-generating staphylococcus.

Straus, in 1884, experimented upon the pus of virulent bubo, and claimed it to be sterile; this result is hardly consistent with the specific germ theory of chancroid. The first work of any accuracy and importance was done by Ducrey, of Naples, in 1889. At that time he presented a paper to the International Congress of Dermatology, entitled "*Recherches expérimentales sur la Nature intime du Principe contagieux du Chancre mou.*" In this essay Ducrey described what he claimed to be the pathogenic bacillus of chancroid, with his methods of coloration and collection in pure, or almost pure, culture by inoculations in series. He showed that the bacillus for which he claimed specificity was always associated with divers other microbes, and finally presented evidence which tended to show the specificity of the germ which he had discovered.

Following Ducrey, the subject has been carefully investigated by numerous observers with varying results. Welander and Krefting, three years after Ducrey's contribution, confirmed his observations, while at the same time Jullien asserted that he had obtained only negative results in the same line of experimentation. In 1892, Unna claimed to have discovered in sections of the tissues, in the neighborhood of a chancroid, a bacillus which he believed to be different from that described by Ducrey, but Nicolle, Columbini, and others afterwards showed the identity of the two. Columbini, Nicolle, and Audry subsequently showed the same bacillus to be present in chancroidal bubo. Numerous other observers have confirmed the latter observation. Columbini's researches, in particular, have been exhaustive and careful, and tend to show that a special form of bacillus is to be found in chancroid and its attendant bubo, and that it is neither susceptible of cultivation nor of inoculation upon the lower animals. It will be observed that the latter point militates somewhat against the specificity of the germ. It is evident, upon surveying the work that has been presented, that the credit of the discovery of a special form of microbe in soft chancre belongs, not to Unna, to whom it has been accredited in some quarters, but to Ducrey.

Accepting the presence of a specific type of germ in chancroid,—irrespective of the question of its etiological specificity,—it may be profitable to consider in a general way the methods of study of the germ which may be employed. It would seem that the germ is quite easily colored, the most varying methods being used for this purpose. Ducrey used gentian violet, methyl blue, or an aqueous solution of fuchsin indifferently, these stains being equally satisfactory. Ducrey, recognizing the multiplicity of germs likely to be present in the chancroidal secretion, used the pus from pustules produced by auto-inoculation. Nicolle's method is perhaps the most simple and practicable. The ulcer is first cleaned with a pledget of absorbent cotton wet with sterilized water. The surface is then gently scraped with a fine blunt curette without producing hemorrhage, the ac-

cumulated secretion being then deposited upon a properly sterilized plate. A second plate is laid upon the first, and the drop of secretion carefully pressed out into a thin layer. The two plates are next separated by sliding them carefully apart, and the preparation fixed in the flame. As will be observed, the method is quite similar to that employed in searching for gonococci. The specimen, being ready for staining, may be prepared either by single or double coloration. In the simple method, the prepared cover-glass is immersed in a solution of gentian violet for about three-quarters of a minute. After washing in distilled water, the specimen is ready for examination. In the double coloration method, the cover-glass should be first immersed in the gentian violet for two or three minutes and then placed in Gram's solution for about one minute, after which it is to be decolorized by absolute alcohol. After decolorization, the specimen should be immersed in fuchsin solution for a few seconds. The special bacillus appears of a rose-red color. The other organisms which may be present in the specimen (notably pus cocci) retain a violet color.

The Ducrey bacillus does not appear to be susceptible to arbitrary arrangement, being found isolated, in masses, or in chain-like form. As seen in its isolated form it is short and rather thick, with rounded extremities. The dimensions of the microbe are quite variable. Ducrey has described the germ as having two lateral notches, which give it something of the appearance of a dumb-bell or of a figure eight. The germ, in a measure, resembles a diplococcus, on account of the peculiar conformation above described. As illustrative of the widely varying interpretation of microscopical forms by different observers of equal competence, it is interesting to know that Nicolle, Petersen, and others have failed to observe the peculiarity of form described by Ducrey.

Naturally enough, those who dispute the accuracy of Ducrey's description attribute the disparity of results to crudity of manipulation or even optical illusions on the part of the opposing faction. The most striking peculiarity of the bacillus is that its affinity for coloring matter appears to be limited to its extremities, the central portion resisting coloration, the resulting appearance having been described as similar to a weaver's shuttle. It would seem, from the most recent observations, that the Ducrey bacillus is most often found isolated, its aggregation in masses being asserted by Nicolle to be due to the disturbance of the pus incidental to rubbing the slides upon each other in the process of preparation for coloration. The chain formation, which is occasionally seen, is short, and rarely comprises more than from two to five bacilli.

In a comprehensive article, Le Damany (*Gaz. hebdom. de Médecine*, January, 1895) sums up the characters of the Ducrey bacillus as found in the pus of simple chancres as follows: "The bacillus, when viewed singly, is short, ordinarily thick, with rounded extremities, and in the centre is a clear space. The germ is frequently grouped in masses or short chains, the latter being sometimes fasciculated, and is decolorized by Gram's method."

The Ducrey bacillus is not uniformly disseminated throughout chancroidal pus; according to Le Damany some preparations contain a very large number of the germs, while in others very few can be detected and only with extreme care. The number varies greatly, not only with specimens taken from the same sore, but more widely still in specimens taken from different sources. The bacilli are found both within and without the pus corpuscles; in some instances the majority of them are found within the pus elements with comparatively few outside of them; in others, again, the reverse is the case. When found within the pus corpuscles the bacillus is generally single.

However strongly the claims of the Ducrey bacillus may be presented, a survey of the varied and manifold kinds of germs found in chancroidal pus in intimate association with the alleged specific bacillus, bears abundant testimony to the decidedly mixed character of the infection. Staphylococci of several varieties, gonococci and streptococci are found in abundance. The gonococci are, of course, most often associated with a complicating gonorrhœal urethritis, but are found in cases in which the latter condition does not exist. Nicolle has found a bacillus similar to the staphylococci ordinarily found in the skin in considerable numbers. This resembles the Ducrey bacillus very strongly, but is readily distinguished by its uniform coloration, and the fact that it is not decolorized by Gram's solution. Other germs have been described,—*e.g.*, septic vibrios, by Pasteur, the bacterium coli commune, and the co-called spirillum of balanitis. It is claimed that the Ducrey bacillus may be isolated by auto-inoculation upon an aseptized surface, but to the practical surgeon it would seem impracticable to obtain in this manner a culture disassociated from pyogenic cocci.

The most important evidence of the specificity of the Ducrey pathogenic organism is the fact that numerous and competent observers have failed, after many attempts, to find the germ in anything but chancroid. Unfortunately, the chain of evidence will be incomplete until pure cultures can be made outside of the tissues,—a condition difficult of accomplishment. As might be expected, the germ endures until cicatrization of the ulcer begins. The transformation of chancroid into simple ulcer, as a *sine qua non* in repair, is a clinical observation as old as chancroid itself.

The relation of the specific bacillus to neighboring pathological changes and to virulent bubo is quite important. To obtain a section, a small area of the ulcer and its sublying tissue is excised by mouse-toothed forceps and knife or scissors; this is fixed, stained, embedded in paraffin, and sections made in the usual manner. It would seem quite easy to select a coloring substance, as picrocarmin, thionin, toluidin, hematoxylin, and methylene blue are of almost equal value. Methyl blue is, of course, rather the simplest and most readily accessible. Under the microscope the Ducrey bacillus and cell nuclei will be found to be a deep blue, while the cell-substance is of a clear, light-blue color. As might be expected, the sections show a multiplicity of bacterial forms, but it is a noteworthy fact that the proportion of

ordinary germs is inversely to their distance from the periphery of the ulcer; thus pus cocci and saprophytes are found so abundantly near the surface of the section that it is often quite difficult to outline the Ducrey bacillus, while in the deeper layers the common bacteria and cocci disappear, leaving the specific micro-organism in undisputed possession of the field. The characteristic arrangement of the specific bacilli seems to be in chains of some length, which again are arranged in bundles. Upwards of a hundred bacilli may be found in a single chain. Phagocytosis is very much in evidence even at an early period, its prominence becoming more pronounced as repair advances.

The Ducrey bacillus, as found in tissue sections, is precisely the same as that found in pus, excepting that instead of a central clear space the coloration is uniform throughout. Examinations of chancroidal and bubonic pus show conclusively that the range of action of the chancroidal germ is practically limited to the point of inoculation. As far back as 1884, Straus claimed that the pus of bubo was absolutely sterile until it had been opened and infected from without. This opinion has since been shown to be only partially correct; but the assertion is still made that in by far the majority of cases the pus of bubo is, prior to communication with the external surface, either sterile or contains only common pus microbes, the Ducrey bacillus being rarely found. Secondary development of virulent properties is claimed to be due to infection from without. Granting that these assertions are correct, the primary bubonic suppuration (?) or tissue liquefaction must be due to the action of toxins upon the leucocytes.

A very obvious source of error is the existence of periadenitic suppuration about infected glands; the discharge of true chancroidal virus from the latter at a variable period after incision explaining the secondary virulent infection. Here, the periadenitic pus might be due to toxins or pus micro-organisms, while the glandular infection proper depended none the less upon Ducrey bacillus infection. Under such circumstances secondary infection of the abscess cavity and wound edges is inevitable sooner or later, and may be wrongly attributed to carelessness. In considering the bacteriology of chancroidal bubo, it is admitted that in many cases the ganglial reaction is of a simple inflammatory character; this is a familiar clinical observation.

Recent inoculation experiments with chancroid upon animals appear to most emphatically contradict the views which have been held in certain quarters for many years, and to show that, like syphilis, chancroid is a disease which is peculiar to the human species. It may fairly be claimed that the successful inoculations practised by Auzias-Turenne, Diday, Basset, and others were really examples of pus-infection upon animals. Indeed, this is the principal argument of those who contradict the conclusions of these observers. Le Damany, in particular, calls attention to the fact that their experiments were not under bacteriological control. It is the belief of the writer, however, that this argument will not be a very effective one until

the germ of chancroid has been isolated by cultivation. Then, too, it will be necessary to explain why the results obtained by the early experimenters were, in some instances, apparently so typical. It is quite as safe to say that on the human subject the typical results of inoculation of chancroidal secretion are due to pus microbes or their products, as in the case of successful inoculations upon animals. It is true that Petersen has claimed to have made a pure culture of the germ, the inoculation of which produced chancroid, but this must be taken with due allowance, especially in view of the fact that Ducrey himself, Nicolle, and others of at least equal enthusiasm and greater experience, have absolutely failed to cultivate the germ in any of the media thus far known. The discovery of the bacillus of Ducrey has given additional impetus to animal experimentation, and the results seem to show that while inoculation upon man produces typical chancroid, those upon animals result only in the development of ordinary pustules. Such are the conclusions of Quinquaud and Nicolle.

It has long been known that the virus of chancroid retains its vital properties for a prolonged period. It will be remembered that Ricord enclosed chancroidal pus in hermetically-sealed tubes, and found that it was still virulent after a lapse of over two weeks. Desiccation does not seem to be very effectual in destroying the virulent properties of the virus. Over forty years ago Spirno claimed that he was able to produce chancroid by inoculation with a lancet upon which chancroidal secretion had been collected and dried seven months previously. It has been a matter of clinical observation for some years that heat, even of moderate intensity, is destructive of chancroidal poison. Aubert some years ago advocated the treatment of chancroid and its attendant bubo by prolonged hot sitz-baths, and the experience of the writer has shown that in certain malignant and destructive cases this method of treatment is well-nigh invaluable. That the germ is rapidly destroyed in complicating febrile conditions is also a matter of clinical observation.

Laboratory experiments justify the time-honored application of strong acids in the treatment of chancroid, by showing that the germ is non-resistant both to acids and powerful alkalies. The conclusion has been drawn, from the results of experiments in the action of heat upon chancroidal virus, that the relatively elevated temperature of the blood in the deeper regions of the body explains the non-constitutional character of chancroid.

Notwithstanding all that has been said regarding the Ducrey bacillus, it must be acknowledged that the case is by no means proven until successful cultures of the germ have been made. Inoculations with the pure culture, and these only, will conclusively demonstrate the specific character of the bacillus, and the writer believes that the virus which has thus far been used with the inoculation experiments nowhere nearly approximates the pure culture demanded in accurate inoculation experiments. It is to be hoped that the condition demanded will be fulfilled in the near future. No pos-

sible benefit will result in the therapeutics of the disease, but cases frequently arise in which a differential diagnosis is very important, and in which, for one reason or another, the test of auto-inoculation is not as satisfactory or as convenient as could be desired. It is not believed by the writer that bacteriology will ever disprove the *de novo* filth origin of chancroid. Should, however, bacteriological research enable us to draw a sharp line of demarcation between simple and specific local ulcers, thus showing that they are *ab initio* in no wise related to each other, a great advance in our pathological knowledge will have been scored. The writer has great faith in the results thus far recorded, but while according due weight to the observations of Ducrey, Unna, and their followers, he is not yet prepared to accept the specificity of the Ducrey bacillus as absolutely proven. Special action is necessary in view of the fact that, as admitted by Ducrey himself, chancroid, as it presents itself clinically, is a decidedly mixed infection with proportionately numerous sources of error and inaccuracy.

CARDIAC AND DIGESTIVE STRAIN FROM BICYCLE RIDING.

BY A. L. BENEDICT, A.M., M.D.,

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The writer does not wish to convey the impression that he thinks he has discovered a new clinical condition, but rather to describe briefly two illustrative cases, out of many that might be cited, and to call attention to some phases of bicycle riding, on which little emphasis has thus far been laid, and which might not be recognized by the most careful hygienist unless he had, at the same time, a practical acquintance with cycling and was familiar not only with the modern, light-weight, safety bicycle but also with its predecessors.

Some weeks ago, H., aged nineteen, rode about a hundred and ten miles in less than a day and a half, including a delay of several hours' necessitated by a lacerated tire. Considering the youth of the patient, his slender build and comparative lack of training, and the roughness of a part of the journey, the feat was a remarkable one. The writer has driven over the same road, with a good horse, in two days and a half, and the horse did not recover his usual spirits for three or four days afterwards. H., on completing his journey, was considerably fatigued, but did not seek medical aid till several hours later, when he vomited almost immediately after a plain supper. At this time, without being feverish or in pain, he suffered from an intense general malaise, was nauseated, and at the same time felt the need of food and water. Bismuth and acetanilid were given to

relieve the nausea and nervous prostration, and the next morning strychnine was ordered in two milligramme doses before each meal on account of digestive failure. The patient was, of course, advised to rest, to take no more bicycle exercise for several days, to sleep as much as possible, and, without being placed on a special diet, to avoid all bulky and indigestible foods, and to subsist mainly on milk, eggs, broiled beef and lamb, and dry bread or toast.

A second case was seen in the person of a man of thirty, who was accustomed to riding but who had been out of practice for some months. After a ride of fifty-two miles, over bad roads for part of the way, and mainly against a head wind, he arrived home utterly exhausted, nauseated, and with a reflex headache. A tablespoonful of whiskey was immediately given, the first he had tasted for years, and therefore a relatively large dose. His temperature was 98° F., pulse weak, irregular, and occasionally intermittent, but not especially rapid, ranging about 85. After two hours' rest on a lounge he went to bed without much assistance but complained of feeling chilly, although the evening was warm. In about an hour more the chilliness had passed away and he took a luncheon of tea and toast. The next day he was able to attend to some business at home, but felt weak and sleepy, had little appetite, and staggered when he walked. During the following day or two he recovered his normal condition, except for a feeling that he must avoid any unusual exertion. Some years previously, the patient said, he had a similar attack, in which chilliness was the prominent symptom and from which without medical aid he recovered sufficiently to continue his journey on the next day. In this latter attack an opportunity was accidentally afforded to study the renal elimination under exertion. After arriving home, the patient voided three hundred cubic centimetres of urine, representing the accumulation of nearly the entire afternoon, after a luncheon of ice-cream, bananas, and chocolate. During two hours of this time the patient had been busy with numerous errands, occasioning about two miles of bicycle riding, in addition to his morning's ride of twenty-two miles, rather less walking, and much standing. Then followed a ride of about thirty miles against the wind, occupying, with halts, a little less than four hours. Contrary to expectations, an increase of elimination was not noted, save that the high specific gravity, dark reddish-brown color, and heavy, almost aromatic odor were taken to indicate an excess of salts, urobilin, and the volatile principle. There was neither albumin nor sugar. Urea was present in the proportion of nineteen parts in one thousand, representing 5.7 grammes, which is less than the average elimination for six hours in the normal adult under ordinary circumstances. Neither was there an excess of uric acid; no urates deposited on standing, and on adding strong hydrochloric acid to one hundred cubic centimetres of urine less than five centigrammes of uric acid were recovered. (The normal, daily elimination is about fifty centigrammes.) It is probable that there was a vicarious elimination through the perspiration and that the

low amount of nitrogenous waste may also be accounted for by the light luncheon.

It is a question whether the luncheon, unsuitable as it appears at first thought, was not a proper one. The patient claimed that when exercising he always relished a light mid-day meal better than a hearty one, and that he usually chose milk foods of some kind with fruit and chocolate. Provided ice-cream is properly made, it is nutritious, and the abstraction of heat was rather indicated than contra-indicated under the circumstances. Bananas contain a large amount of raw starch, so that they are digested in the intestine and not in the stomach. In this connection, it must be noted that not only is functional intestinal indigestion less frequently encountered than the corresponding gastric condition, but also that the temporary abeyance of the digestive powers during exercise affects the stomach rather than the intestine. Chocolate contains theobromine (dimethylxanthine), which seems to have a stimulating effect similar to that of caffeine (trimethylxanthine), of tea, coffee, guarana, etc. Perhaps because it contains less methyl, chocolate seems to produce less after-depression than coffee or tea. Bearing in mind that the average person stands in need of a fast rather than of a meal, there is much to commend the practical judgment of the bicyclist in favor of a light and almost trashy luncheon.

A friend of the writer has lately rejected an applicant for insurance on account of a heart murmur apparently dating from a strain during a long bicycle ride. Several cases of sudden death have also been reported recently, but most of these have been in the persons of old men or those with grave cardiac or arterial disease. It is, also, not rare for bicyclists to faint from excessive exertion or to succumb to mild heat-prostration. These cases, however, do not usually come to the attention of the physician, on account of his inaccessibility at the emergency. The two present cases illustrate what the writer considers the moderate and typical grade of cardiac and nervous strain of bicycling. There is nothing extraordinary in the occurrence of such cases, nor do they present any marked peculiarity to distinguish them from the results of other strains. Nevertheless, the writer has observed an apparently increased liability to digestive exhaustion, and we must bear in mind the facts that bicyclists are not, as a rule, accustomed to severe physical exercise, and that they are subjected to a combination of mechanical and mental strain which differs from the mere muscular fatigue of the majority of manual occupations.

No one, who has not experienced it, has the slightest conception of the fatigue of bicycle riding. The poetical notions that one flies through the air, that distance is annihilated without a corresponding expenditure of energy, that the sport is all exhilaration are carefully fostered by advertisements, and the grimy, sweat-lathered reality of a country ride is kept in the background. Cycling is rare sport, but it is not adapted to the delicate nor the lazy. In particular, no physician is competent to recommend it as an exercise till he has had actual personal experience with all

kinds of wheeling. It must be understood that a totally different set of muscles are called into play from those used in walking, and that, save for the general physical reserve, an accomplished pedestrian who can make his twenty-five miles a day across country is not much better adapted to wheeling than one of sedentary habits. In walking, the action of the knee is almost entirely due to inertia and only slightly to muscular contraction, while the principal work falls on the muscles of the lower leg which move the ankle. On the other hand, a properly mounted bicyclist has comparatively little ankle strain, but turns the crank mainly by the contraction of the quadriceps, a muscle whose forced action is otherwise occasioned by kicking and stair-climbing and by very few other motions. It is well understood that climbing is an exercise to be particularly guarded against in those suffering from severe pulmonary, cardiac, and vascular disease, and it should be equally well understood that wheeling differs only in degree from climbing. In fact, if we imagine a person climbing a flight of stairs with some one boosting him with a perineal saddle, we have an almost exact conception of the work of the cyclist. On down-grades, the "boost" is almost sufficient to support the whole weight of the body, on slight upward inclines it is much less, on steep grades the relative "boost" is lessened progressively, till the cyclist raises his weight free from the saddle in the ineffectual endeavor to propel his machine.

In the days of the "ordinary" and of the Star bicycle, with its levers, the rider sat almost directly over the pedals, so that muscular contraction was assisted by gravity, and the maximum exertion was in the vertical direction, into which the limb naturally straightens itself by the symmetrical action of the muscles on the alternately concave and convex angles of its joints. The early safety, though clumsily constructed, retained this important advantage. Then, following the English lead, the saddle was placed so far behind the sprocket-wheel that the revolution of the pedals required an unnatural forward thrust of the leg, while the back was arched and the chest constricted in leaning over to reach the handle bar. Against this constrained attitude a protest is just beginning to make itself felt.

Wheeling cannot be considered in the same hygienic category as walking. Mile for mile, under ordinary circumstances, the former requires less exertion. Hour for hour, unless on a down grade, it is much harder exercise, about fifty per cent. harder for the rational cyclist, double if we contrast the fast walker with the "scorcher." The strain, in one of the cases reported, is ascribed largely to a head wind. The fact that the resistance of the air is almost entirely ignored in the construction of vehicles intended for speed shows how little this element is appreciated. A wind of ten miles an hour, plus the speed of the wheelman, is a very considerable obstacle, riding against a wind of twenty miles an hour is like climbing a steep and endless hill, while a gale of forty miles an hour will render progress practically impossible.

The nervous strain of walking is almost nothing and the mind is free for recreation. "Eternal vigilance is the price of safety" for the cyclist, and any enjoyment of scenery must be had by dismounting or by snatching momentary glances at a rapidly-moving landscape. Thus the eye-strain alone becomes an important consideration, and it may well be that the especial liability to nausea and vomiting in cycling fatigue is due to this factor. The term "safety" as applied to a bicycle is only relatively correct. A header is almost impossible and other falls are reduced in height, but there is still the ever-present danger from loose stones, car-rails, curbs, and ruts, while the average driver of horses is, wilfully or through ignorance, utterly without regard for the life and limb of the wheelman. The jar of the bicycle must also be considered, and, contrary to current belief, the writer finds that the pneumatic tire is scarcely as efficient against this factor as the old-fashioned spring frame with solid tire, while there is added the constant apprehension of a breakdown through puncture of the tube.

As to the treatment of bicycle strain, little need be said in addition to the remarks in the case reports. Acetanilid is a valuable drug in the treatment of nausea and nervous depression, not only on account of its local action on nerve tissue, but because it checks fermentation, which is liable to occur in a stomach whose normal secretion is suppressed. Objection may be made to its use in any case of cardiac depression, but the writer believes that moderate doses are not paralyzant to the heart, but, perhaps, indirectly stimulating. The most important consideration in the treatment of all similar cases is the liability of a strained heart to dilate. This liability must be combated with rest for several days, the degree of enforced inactivity varying with the severity of the case. After the first indication for diffusible stimulants is met, the heart should not be medicated. A heart that is permanently or at least chronically weak may be benefited by strychnine, digitalis, strophanthus, and the like, but a heart in a state of recent strain needs rest, and not stimulation. The use of strychnine in the first case is an inconsistency not overlooked at the time of its administration, but apparently demanded by the digestive failure. Care was taken that no false feeling of strength, due to the possible action of strychnine on the heart, should lead the patient into exertions for which he was unfitted. In the second case, there being no call for a digestive stimulant, no such drug was administered.

A CASE OF TRAUMATIC CARDIAC NEUROSIS.[1]

BY J. C. MULHALL, M.D.,
of St. Louis.

Miss C. W., school-teacher, aged twenty-six, when first seen, in January, 1893, was suffering from a peritonsillar abscess. On recovery she came under my care for treatment, designed to prevent recurrence of this trouble, from which she had been a frequent sufferer.

Bearing in mind rheumatism as a possible etiological factor, I examined the heart while the patient was erect and recumbent for evidence of endocardial changes, but with negative result. The patient did not remember to have had symptoms of rheumatism, and her general health had always been good. General irregular thickening of the tonsils, which were adherent to the soft palate, existed. Curette and scissors were employed with a view of removing every vestige of tonsil tissue. The patient lacked courage and permitted very little to be done at a sitting. Treatment was therefore prolonged over quite a period of time. At one visit she complained of shortness of breath, and I again examined the heart, but with a negative result. Flatulence, following a hearty meal eaten late the previous evening, explained the sighing respiration. I mention these two examinations of the heart, since they have an important legal bearing on what is to follow.

One day, three months later, she entered the office bearing the marks on her face of several superficial incised wounds. She seemed anxious and frightened, not, as she explained, because of these slight cuts, but because of a sensation in the region of the heart which she had never before experienced. It was at times that of a fluttering bird, again a sense of weight or constriction, and was accompanied by sobbing respiration, but not by true dyspnœa. As she was originally of a highly emotional temperament, her sensations had produced profound alarm within her. She stated that while occupying the most forward seat on the west side of a cable-car going northward, another car, proceeding eastward and therefore unperceived by her, had collided with the car in which she was seated, throwing her forward with sufficient violence to shatter the window-pane. She was so agitated at the time that she could not recall many details, but did not remember any concussion of the chest wall, though she recalled the fact that her heart-symptoms had occurred at once. Examination disclosed no contusion of the chest wall, nor was there any tenderness on pressure. There was no thrill on palpation, the impulse was feeble, and the apex-beat was not dis-

[1] Read before the American Climatological Association, at Hot Springs, Virginia, June 13, 1895.

placed. The pulse was small, feeble, irregular, and, even after the patient had rested fifteen minutes, ninety per minute. The pitch of the pulmonic sound was higher than that of the aortic, its intensity equal. In the mitral area the first sound was feeble, and accompanied by a loud murmur. As one approached the axilla and angle of the scapula the first sound was lost, being entirely replaced by the murmur. It bore the characteristics of an hæmic murmur, but was of much greater intensity.

She was ordered to rest from her work, and given tincture of strophanthus in five-drop doses four times daily. At the end of a week the pericardial anxiety occurred at longer intervals, and she was able partially to resume her duties. At the end of three months she had no subjective symptoms, except when she allowed herself to be overworked or when she participated in some emotional disturbance, at which time either the sense of constriction or some tumultuous action of the heart was observed. The murmur was of much less intensity. At the end of six months all subjective symptoms had ceased and the murmur could only be heard, the patient recumbent. To-day, fifteen months from the time of the accident, no abnormal physical signs or symptoms exist.

Six months from the date of injury, the patient, through her lawyer, presented a petition for damages, asking for seven hundred and fifty dollars, alleging loss of service and much physical suffering, with grave anxiety pending the outcome of the heart affection. The facts in the case proved negligence. My medico-legal brief recited the important fact of acquaintance with the condition of the heart before the date of injury, and the facts in the case immediately and remotely subsequent. My opinion was also stated that not only was there a general traumatic neurasthenia incident to railway collisions without discoverable marks of violence, but that this unstable nervous condition might be confined to one organ, as, for example, the heart. Malingering was out of the question, for, though she might deceive us as to subjective suffering, she could not produce a mitral regurgitant murmur. She was, without suit, awarded the damages asked for.

The murmur in this case can hardly be explained on any other hypothesis than that there existed dilatation of the left ventricle and consequent non-approximation of the mitral segments, the result of a functional paralysis of certain cardio-motor nerves.

REVIEW OF MEDICINE.

MEDICINE.

IN CHARGE OF JOHN H. MUSSER, M.D.,
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AND

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A Case of Local Variola. (*Von Graefe's Arch. f. Ophthalm.*, vol. xli., No. 1.) By A. Wagenmann.

A woman, thirty-three years of age, while bathing a sister sick with variola, sprinkled some of the water in her own face and right eye. She had been vaccinated successfully in her first, eleventh, and twenty-first years. On April 27, seven days after the accidental inoculation, the right eye began to itch, on the 29th there was slight reddening, on the 30th there was swelling of the lid and injection of the ocular conjunctiva. Later the lower lid became everted, and two yellowish-white spots the size of the head of a pin appeared, one on the edge of the lid, the other on the tarsal conjunctiva near the beginning of the fold. Opposite the inner pustule the conjunctiva was red and thickened, and on the following day two ulcers appeared at the point of contact. On one day, May 3, the temperature rose to 39° C. On May 11 these pustules had completely healed, but others were appearing on the body.

The incubation period was about five days, while in true small-pox it is twelve. This deviation and the aborted course the author thinks are due to partial immunity, for inoculation into the skin may cause the appearance of a vesicle in from four to eight days, or if the person has been successfully vaccinated several times no vesicle is formed.—*Centralblatt für Bakteriologie und Parasitenkunde*, October, 1895.

Symptomatology of Cutaneous Actinomycosis. (*Journal des Sciences médicales de Lille*, August 31, 1895.) By Dr. F. Monestié.

In the course of a dental caries, or following a small wound, the patient becomes aware of a movable, rounded, regular tumor, which seems to be situated in the subcutaneous cellular tissue. This tumor may have arisen without known cause, or it may have made its appearance after the patient had eaten an ear of corn or after he had scratched himself with a finger

which was soiled by pus from a focus of actinomycosis. The patient can feel the tumor in the mouth, but it is clearly independent of the mucous membrane. In nearly all cases the tumor gives rise to neuralgic pains, which the patients voluntarily call toothache, but these pains are not clearly localized, and are even felt in the head. When the onset is sudden the patient thinks he has an inflammatory affection of the tooth, but this trouble, instead of improving at the end of a few days, gains ground steadily, and at the end of a month or two has increased in volume, and has begun to be perceptible from the external surface. The tumor also becomes adherent to the derm, which is insidiously inflamed. The skin lesion appears in a gummatous and in an anthracoid form. In the gummatous variety there are cavities resembling tuberculous or syphilitic gummata, containing considerable pus. Each cavity opens by a small number of fistulæ. In the anthracoid variety a very large number of fistulæ are present; from these a small quantity of pus escapes, the pus is not clearly massed at one point, and the whole lesion resembles a sieve. The skin is at first rose-colored, then red, and finally becomes wine-red. The epidermis of the affected regions desquamates in fine scales, particularly at the margins. Blackish crusts form here and there from the hardened pus and dried blood. These are free at the margins and adherent at the centre, and they obliterate a fistula. As these crusts detach themselves gradually, a crop of gelatiniform, translucent, semi-transparent, flabby granulations springs up. These crusts often give a tuberculous character to the lesion. There are numberless projections separated by furrows, which, on the one hand, are shallow and numerous, and, on the other hand, are deep and few. The deep furrows formed by the union of smaller furrows mark off large tubercles. Derville has described certain spots which he considers pathognomonic. These spots are more or less deep in color according as the general color of the lesion is more or less pronounced. If the general color is pale, the spots are bluish-red or violet; if the tint of the mass is deeper the spots present a blackish or slate color. These spots vary in size from that of a pea to that of a pin's head. In form they may be regularly rounded, and in the centre there is a white point, resembling a point of folliculitis. The epidermis near these spots seems to cover the granulations, and the translucent appearance which the lesion presents at this level is due to the intimate relation between the epidermis and the flabby fungosities which form the actinomycotic mass. These spots appear to correspond to the points at which the wall of the abscess is thinnest. The examination of these lesions by palpation reveals a central, superficial zone, which is projecting and which is flabby, distinctly elastic, and tender to the touch, and a peripheral, deep zone surrounding the central zone, which is very resistant, of a woody hardness, and begins from one to two centimetres from the circumference of the central part, and reaches a thickness of a half centimetre. The central zone gives the sensation of a very thin skin raised up by fungoid masses, and it is here alone that fistulæ form ; in certain parts a

sensation of fluctuation may be detected, but it is not clear, and always suggests the fungous masses. The peripheral zone sometimes appears to adhere to the deep parts, and at other times it is limited to the subcutaneous cellular tissue; it does not project above the surrounding parts and its color is a little less marked than that of the centre of the lesion. A characteristic sero-purulent fluid is discharged from the lesion, which contains solid particles mixed with blood. If this fluid is collected in a small glass tube, the liquid part will go to the bottom of the tube, and the solid parts will adhere to the sides. The solid part is of the nature of little grains of a brilliant, sulphur-yellow or yellowish-white color, about as large as the head of a pin. These grains are clusters of actinomyces. Pain is practically the only subjective symptom. This may arise spontaneously by the formation of new fistulæ or it may be started up by pressure. Cutaneous actinomycosis is less debilitating than is actinomycosis of the viscera; but it has a bad effect, either directly or indirectly, upon the whole economy. In all cases a few painless and distinctly enlarged lymphatic glands have been found. The adenitis is not constant in its situation, being at times bilateral, at times situated on the same side as, and again, on the opposite side to the lesion. Cutaneous actinomycosis affects the face usually, and is seen in the hands next in order of frequency.

Santini's Hydatid Resounding or Booming as a Diagnostic Sign of Multiple Hydatid Cysts. (*Australasian Medical Gazette*, August 20, 1895.) By Thomas Fiaschi, M.D., of Sydney.

Hydatid resounding or booming was first described by Dr. Santini, an Italian, under the name of *sonorità idatigena*. The sound is described as being elicited by auscultatory percussion of a suspected hydatid cyst, and as having a sonorous booming character, of low tone, brief, and ending in a rapid manner, *rimbombo sonoro*. It is compared to the sound obtained on percussing a membrane stretched on a metallic frame. The author has looked for this sign in all cases of abdominal hydatids which he has seen, and concludes that this special sound exists. It is a valuable addition to the semeiology of hydatid disease, and may be the means of preventing many useless exploratory incisions. It will be valuable in differentiating between hydatid cysts and other soft, smooth, and elastic abdominal growths, such as soft sarcomata. It will also enable one to distinguish between single and multiple cysts. In the former condition the hydatid resounding will be uniform in tone, no matter what point of the tumor is percussed. In the latter condition, if percussion is made over a cyst to which the stethoscope is not applied, the hydatid resounding will be different in tone from that elicited by percussion on the same cyst as that over which the stethoscope is applied.

A Case of Aneurism of the Heart and a Probable Diagnostic Sign of such Condition. (*Australian Medical Journal*, August 20, 1895.) By E. H. Embley, M.B., B.S. (Melb.), of Melbourne.

The case reported presented an increased area of cardiac dulness and the presence, on auscultation, of a musical sound, quite distinct from the normal sounds and obscuring them. This sound was humming in character, high in pitch, continuous throughout the entire cardiac cycle, rising in systole and falling in diastole, and audible from apex to base, but loudest at the apex. The distinctly uninterrupted continuity, the easy rise and fall, the absence of see-saw indications of a backward and forward flow, and the high pitch of the musical sound denoted a small tag of substance vibrating in a continuous current and increasing in the intensity of its vibrations with the increase of intracardiac pressure. The patient died, and at the necropsy a small, ragged opening was found in the posterior wall of the left ventricle, in an aneurismal dilatation of the wall of the ventricle. In the light of the autopsy the explanation of the abnormal sound is easy. The unemptied portion of the heart, in which the gyrations of blood occurred that caused the continuous vibrations, was the aneurismal dilatation, in the thin wall of which the perforation occurred. Although the presence of a tag of substance, so situated in the aneurismal sac as to vibrate in the above mentioned manner, is rare; yet, when it is met with, it should indicate a heart cavity unemptied at the end of its systole and an aneurism.

New Methods of Diagnosis and Treatment of Diseases of the Stomach and Intestines. (*American Medico-Surgical Bulletin*, July 1, 1895.) By Fenton B. Turck, M.D.

The *gyromele* consists of a flexible cable, to the end of which is attached a sponge, covering a spiral spring. The cable passes through a rubber tube, and this again is attached to a revolving apparatus not unlike a surgical drill, for the purpose of producing revolutions of the sponge. This is introduced into the stomach for diagnostic and therapeutic purposes. For exploring purposes the instrument is introduced into the œsophagus, sigmoid, bladder, or any cavity. For the purpose of exploring strictures of the œsophagus, ivory bulbs are attached. The indications for its use in the stomach are: the removal of adherent material from the walls; the application of antiseptics and medicaments; direct internal massage of the walls of the stomach; the application of an electrode to the entire stomach, so that every part of the organ is reached.

The author devised the *gastric motor meter* for determining the contractility and movements of the stomach. It consists of a small rubber tube, to one end of which is attached a small oblong rubber bag. The collapsed bag is introduced into the stomach, and when inflated is connected with a manometer and a recording cylinder which gives a tracing curve of the various movements.

The *stomach needle-douche* consists of a double tube,—a small, short tube with a perforated ball at one end to be introduced into the stomach, and a larger tube for the immediate return of the water. This instrument is introduced into the stomach so that the perforated ball passes just beyond the

cardiac opening. The stomach is now inflated with air to distend it, and a strong force of water is passed through the smaller tube, which projects the shower, and returns immediately through the larger tube. The advantages of this process of cleaning the stomach are: it removes material from the walls; water returns at once, avoiding over-distention and weighting down of the stomach with water. It is a vasomotor stimulant.

The *nebulizer* is used for coating the stomach with a fine cloud of the essential oils and other medicaments. It consists of a nebulizing bottle connected with an extra bottle, to which a double tube is attached. The inner tube extends into the stomach, the outer tube extends only to the cardia.

A *stomach-tube filter* is used for the purpose of withdrawing fluid from the stomach in cases of hypersecretions.

Alcoholic Disease of the Heart. (*British Medico-Chirurgical Journal*, June, 1895.) By Theodore Fisher, M.D., London.

It is only within the last few years that alcohol has been suspected of producing a definite cardiac disease. Bollinger, of Munich, appears to have been the first to attribute the cases of large heart for which no recognized cause of hypertrophy could be found to over-indulgence in alcohol, and other writers have since supported him in his conclusion.

A history of symptoms of heart-failure, lasting from two to three years, is usually given in these cases, although in some instances dyspnœa has been present only two or three weeks before the patient came under observation. Apart from the occasional presence of unusually well-marked cyanosis these cases do not differ materially from other cases of heart-failure, the same dyspnœa and orthopnœa and œdema of the legs being present. The physical signs indicating a large heart, such as increased dulness and a displaced impulse, are usually found. A systolic apex-murmur is common, owing to dilatation of the mitral orifice with the left ventricle, and dilatation of the right ventricle may give rise to a tricuspid murmur. In some cases where no murmur is present a triple sound may be heard, and in still others the sounds may be quite normal. The pulse is generally of low tension, is often irregular, and usually of increased rapidity. The liver is commonly enlarged.

In the diagnosis of alcoholic disease of the heart from the large heart associated with valve-disease, kidney-diseases, or affections of the heart muscle, it is well to remember that fatty degeneration rarely, if ever, exists as the only heart lesion. In fibroid disease severe cardiac pain is a common symptom, and sudden death is a frequent occurrence.

If the heart-failure be gradual the clinical signs are the same as in alcoholic disease of the heart, and apart from a history of intemperance it is almost impossible to make a diagnosis. In the heart-failure of hypertrophy associated with Bright's disease the presence of a high-tension pulse may render some aid in diagnosis; but this sign may fail, and a pulse of re-

markably low tension be present. When it is necessary to distinguish cases of alcoholic enlargement of the heart in which a mitral systolic murmur is heard, from cases of mitral stenosis in which the same murmur only is audible, the following points may be of value: Mitral stenosis generally leads to death before the age of thirty-five, whereas alcoholic disease occurs most commonly after that age. Mitral stenosis is most common in women; alcoholic disease in men. The history of rheumatism or chorea on the one hand, and of over-indulgence in alcohol on the other, may also aid us in arriving at a correct conclusion.

Two Cases of Primary Chancre of the Nasal Septum. (*Revue de Laryngologie, d'Otologie, et de Rhinologie,* July, 1895.)

The first case was that of a man twenty-two years of age, who presented himself at the clinic of the Croix-Rousse complaining of an obstruction in the right nares. On examination, an elliptical, depressed ulcer covered with a brownish crust was found on the inferior portion of the septum. The mucous membrane was swollen and caused almost complete occlusion. A diagnosis of chancre of the septum was made. The tonsils showed mucous patches and the right submaxillary was enlarged.

Two months previously the patient had suffered with pain in the right parotid at the angle of the jaw, which was followed by the appearance of the ulcer on the septum and swelling of the submaxillary. In about four weeks nocturnal headaches came on, and in the sixth week a cutaneous eruption appeared.

The second case presented an ulcer of the left nares with complete occlusion. The patient complained of persistent headache. He was first seen on May 15, 1894. On July 18, mucous patches were found in the throat and a roseola on the body.

In both cases no history of infection could be elicited and lesions were not found on the genitals. The interesting points are the situation of the ulcer and the mode of introduction of the virus, which was probably by the fingers.

THERAPEUTICS.

IN CHARGE OF ALEXANDER D. BLACKADER, B.A., M.D.,
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ASSISTED BY
D. J. EVANS, M.D.

The Treatment of Goitre and Exophthalmic Goitre by Thyroid Extracts and Desiccated Thyroids. (*New York Medical Journal,* September 7, 1895.) By E. Fletcher Ingalls, M.D., and Henry G. Ohls, M.D., of Chicago.

The author reports six cases of goitre, occurring in his own practice,

which were treated with thyroid extracts and desiccated thyroids. In addition to these he has received reports of forty-four cases by personal letter, making a total of fifty cases. Of these cases the swelling was reduced in thirty-eight cases, the swelling was not affected in eleven cases, and there was no report in one case. The symptoms noted after the administration of this remedy have been headache, trembling, rapid pulse, weakness, backache, nausea, nervousness, and uterine contractions. Twenty-five patients lost in weight and two gained in weight. One case is reported as having been improved mentally. From the history of the subject and analysis of the cases we may conclude: First, that thyroid products produce marked physiological effects upon the nervous and circulatory systems. Second, some of the unpleasant symptoms usually occur when a daily dose is reached corresponding to one and a half or two entire thyroid glands of the sheep. Third, if the administration of the remedy in doses that cause such symptoms is continued for a few days, constitutional symptoms are produced which indicate the possibility of fatal results. Fourth, desiccated thyroid glands appear quite as active as the liquid extracts, and they are more stable. Fifth, internal administration appears quite as effective as hypodermic medication. Sixth, for internal use, the dose for an adult should not exceed two grains three times daily at first. Seventh, the remedy, in some cases, has a pronounced effect on the body weight, but this is uncertain and variable. Eighth, the remedy has certain value in the treatment of myxedema. Ninth, in exophthalmic goitre the remedy causes a rapid reduction in the size of the gland, but it has no perceptible effect upon the exophthalmia, and it apparently aggravates the heart symptoms. Tenth, in cases of goitre improvement or cure may confidently be expected in seventy-six per cent. of the cases. Sufficient time has not elapsed, however, to determine what the final results will be. It is probable that cystic growths in the thyroid gland would not be influenced. Eleventh, clinical experience would indicate that further experimentation in other directions is advisable.

Ferripyrin for Hemorrhages from the Gums. (*Therapeutische Monatshefte*, 1895, No. 7.)

In bleeding from the gums after extraction of teeth Frohmann, of Berlin, has used ferripyrin with good results in over one hundred cases. In the case of the lower jaw a small amount of the powder is sprinkled over the bleeding surface from a small spoon; in the upper jaw a small pencil of cotton is moistened, dipped in the powder, and applied to the spot. One application is usually sufficient, and the pain is diminished, probably due to the action of the antipyrin.—*Excerpta Medica*, 1895, vol. v., No. 1.

Resorcin for Frost-Bite. (*Monatshefte für praktische Dermatologie*, 1895, vol. xxi., No. 4.) C. Boeck, of Christiania, recommends highly the following prescription for frost-bites.

℞ Ichthyol,
Resorcin,
Acid. tannic., āā 1.0;
Aq. dest., 5.0. M.
Sig.—Apply with a brush every evening.

The drawback to the use of this combination being that the hands are blackened and dirty looking. The resorcin can be applied as follows:

℞ Resorcin, 2.0;
Mucil. acaciæ,
Aq. dest., āā 5.0;
Talk. pulv., 1.0. M.
Sig.—Apply to the affected area.

In very rare cases the resorcin is not well borne by the patient.—*Excerpta Medica*, 1895, vol. v., No. 1.

The Therapeutic Value of Water in the Treatment of some Nervous and Mental Conditions. (*Medical Record*, September 21, 1895.) By Horace Phillips, M.D., of Philadelphia.

The physiological effects of heat, when applied to the surface of the body, are a partial vasomotor paralysis with a consequent dilatation of the whole capillary system, an increased pulse which becomes less tense and more rapid from a fall of blood-pressure, a general condition of passive hyperæmia with a decidedly increased activity of the skin. The urine is found to be scanty and to contain a less amount of urea. The temperature of the body will be found to have increased while the patient is in the bath, but it rapidly falls when the patient is withdrawn, due to the increased area of blood exposed in the congested vessels. The physiological effects upon the vascular and nervous systems produced by cold are: first, the stimulation of the vasomotor system and an exaltation of the spinal reflexes with a contraction of the terminal blood-vessels, slowing of the current of blood, a diminution of the number of corpuscles, and a gradual paling of the tissues. Dilatation of the vessels then ensues, due to a partial paralysis of the vasomotor system, with an accumulation of blood in the terminal vessels, causing a cyanotic condition of the surface. The pulse falls quite perceptibly, due to the stimulation of the inhibitory cardiac nerves, and this is associated with a decided fall in blood-pressure. The respirations become slower, the secretion of urine is scanty, and the liver and deeper structures become congested. The temperature of the surface falls. The proper temperature for a hot bath is between 98° F. and 128° F.; that of a cold bath should be between 50° F. and 70° F.

Lower temperatures are better borne, and the reaction is more prompt when exercise, either by massage or by muscular exertion, is practised, but not carried to the point of fatigue. No influences should be exerted which tend to demand an increased local supply of blood; hence no food should be taken before a bath, and the same is true of alcohol or other stimulant.

In persons of tender years and in those who are advanced in life or who are suffering from organic disease of any vascular or excretive organs, the warm bath, 70° F. to 95° F., embraces most of the beneficial effects which are derived from the cold bath with but few of its dangers. Neurasthenic conditions are susceptible to benefit from the action of water. The lack of tone, increased excitability, and a tendency to rapid fatigue of the muscular system would, one and all, be benefited by the bath. Although the cold bath would seem to be indicated in such conditions, the impaired physical condition would contra-indicate its use. The warm bath is generally applicable in melancholia, it has done excellent service in acute mania, and it is to be recommended in chronic mania, dementia, and epilepsy. Cold baths have been strongly urged in the acute stages of general paralysis.

On Septentrionalin as an Anæsthetic and Substitute for Curare in the Performance of Vivisection. (*British Medical Journal*, September 14, 1895.) By H. V. Rosendahl, of the University of Upsala.

Rosendahl has isolated from aconitum lycoctonum (L.), growing in Sweden, three alkaloids; one of these, septentrionalin, appears to be of practical use, especially to the experimental physiologist and pharmacologist. This drug is a white or slightly yellowish powder of a bitter taste, producing after a short time a local anæsthetic effect. Fusion point, 128.9° C. Rotates light to right. Soluble in 1.7 parts of alcohol, in 2.1 parts of ether, and in 58 parts of water. Given *per os*, the septentrionalin produces no general poisonous effects. Subcutaneous or intravenous injection is followed by increased salivation and sometimes nausea, never by vomiting. By its use the sensory nerve-endings are paralyzed, and it may, for that reason, be used for obtaining a local or general anæsthesia. A motor peripheral paralyzing action follows the paralysis of sensibility, during which the animal lies quite motionless, and, if the dose be large enough, is free from all reaction during any operation. The respiration ceases first, the heart being the *ultimum moriens*. If artificial respiration be employed the animal is kept alive and well in consequence of the rapid elimination of the poison, and soon recovers without any signs of the animal's health having been influenced in any way by the intoxication. After injecting the minimum quantity of septentrionalin the blood-pressure sinks immediately, but only for a moment. If a deep intoxication be maintained by frequent injections the rate of the pulse is considerably diminished, while at the same time the contractions of the heart continue for a long time with undiminished force.

Tetanus produced by strychnine yields immediately both in frogs and warm-blooded animals by injections. Abnormal post-mortem appearances are reduced to subpleural ecchymoses and engorgement of the blood-vessels in the abdominal organs. The toxic dose required for curarization is, per kilogramme of body-weight,—for frogs, 0.000174 to 0.0005 gramme; for dogs, 0.007 gramme; for cats, 0.01 gramme; for rabbits, 0.003 to 0.005 gramme, and for fowls, 0.009 gramme.

Report on Eliminative and Antiseptic Treatment of Typhoid Fever. (*Medical Record*, September 14, 1895.) By W. B. Thistle, M.D., of Toronto.

This is the third report on this method of treating typhoid fever that Dr. Thistle has made since 1893. If we recall the fact that bacteria bring about disturbance by virtue of the toxic substances which they produce, we will perceive clearly that the condition in typhoid is one of continuous intoxication. The primary and chief source of the poison is the alimentary canal, although some portion of the toxæmia must be attributed to poison elaborated by bacteria which have been carried from the intestine and deposited in the various tissues in the body, notably the lymphatic nodes of the intestine and mesentery. Locally, the typhoid toxin will irritate tissue cells and produce swelling, congestion, and irritation of the parts. If it becomes concentrated to a sufficient degree, the irritation is replaced by complete destruction or necrosis. The necrosis may be brought about not so much on account of the concentration of the poison as on account of the long continuance of contact. The general symptoms are increased or diminished according to the amount of poison in the body. The extent or degree of local lesion is determined by the degree of concentration of the poison and the duration of contact. The infection, whether it is due to the Eberth bacillus or to a modified colon bacillus, comes from without and takes on active growth in the small intestine. Considering these facts in relation to the cause and characteristics of this infection, the indications seem to be elimination, antisepsis, and dilution. Elimination is accomplished by free and continuous purgation as well as by the flushing action of large quantities of water on kidneys and bowels. By the use of purgative medicines bacilli are carried out of the intestine, together with the toxic substances produced by them. Poison held in solution by the body fluids escapes with the free secretion into the intestine, and a quantity of extremely toxic bile is swept away instead of continuing in the circuit from the liver to the intestine and back again. If constantly relieved in this way, the liver can more frequently perform its *rôle* of standing guard and intercepting toxic substances which would otherwise reach the general circulation. Infection of the intestinal glands is limited, or, in other words, the source of supply from which bacilli and poison are carried from the intestine is cut off. By repeating this process a dangerous accumulation of toxin in the system is prevented, and at the same time it tends to prevent local lesion in the intestine from becoming sufficiently great to destroy a vessel or to extend entirely through the intestinal wall. There can scarcely be a doubt about the possibility of destroying micro-organisms in the alimentary tract to some degree by antiseptics. But to be efficient antiseptics should be used in association with purgatives, for the following reasons: 1. Just as it is easier to approximately sterilize an abscess cavity after having emptied it, so is it to derive benefit from intestinal antiseptics if the intestine be first cleared of its contents. 2. Intestinal antiseptics, while lessening the production of poison by destroying

bacilli, yet could have no possible effect on the poison already in the intestine, but in many instances might themselves add to the toxins present. 3. Much larger quantities of antiseptics can be used without poisonous symptoms arising if, at the same time, elimination by the bowels is continuously maintained. Any benefit derived from an antiseptic is obtained at once, and if it is speedily cleared away much which would otherwise be absorbed escapes with the contents of the bowel. Dilution is clearly indicated, for the local effect of the poison depends upon its degree of concentration as well as upon the duration of contact. Purgation at no time causes perforation or hemorrhage, but at all times tends to prevent its occurrence. The author reports one hundred and seventy-two cases, with a mortality of five,—or three per cent. No death from toxæmia and no perforation. Hemorrhage in eight cases, including two fatal cases. Tympanites never developed during treatment, and, where present at first, invariably disappeared as soon as elimination was freely secured. Delirium practically unknown after the first days. Out of sixty-four charts in the possession of the author, fifty-eight show that the highest temperature reached was in the first three days. The pulse improves with the general symptoms. Diarrhœa never required controlling treatment. Catharsis was produced by three or four grains of calomel in divided, half-grain doses, followed by a saline in three or four hours. Other cathartics or salines may be used. Elimination should be secured quickly. Four cases with their accompanying temperature charts are reported.

SURGERY.

IN CHARGE OF HENRY R. WHARTON, M.D.,

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The Operative Treatment of Hernia. (*American Journal of the Medical Sciences*, July, 1895.) By W. S. Halsted, M.D., of Baltimore.

In the treatment of hernia the problem is to close a rent in the abdominal wall and to provide for the safe transmission of the spermatic cord. The cord is the first cause of the hernia and the ultimate obstacle to its cure. A reduction in the size of the cord would lessen the liability of the hernia to recur, and the cord may be reduced to less than one-third its original size by excising the superfluous veins. In closing the abdominal wall the incision is continued through the internal oblique and transversalis muscles for about an inch, and the upper fibres of the cremaster, together with the

cut fibres of the internal oblique and transversalis muscles are included within mattress sutures in the same manner as other abdominal wounds are closed. There are usually six of these deep stitches, which are taken not more than one centimetre apart. The vas deferens, with its arteries and remaining veins, is brought forward between the two outermost stitches, which are closer together than the others, and which embrace the cord snugly. When the deep wound is closed, muscles should be seen throughout the greater part of it, projecting between the cut edges of the aponeurosis of the external oblique muscle. These edges are then made to embrace the cord more snugly at the point where it passes between them by two very fine stitches. The skin incision is closed with an uninterrupted suture. The cord by these proceedings is transplanted so that it lies superficial to the aponeurosis of the external oblique. Silver wire is used as a suture material, and the wound is covered with silver foil. This has an inhibiting influence on the growth of bacteria.

A Case of Cancer of the Urethra. (*Boston Medical and Surgical Journal*, September 26, 1895.) By A. T. Cabot, A.M., M.D., of Boston.

The author reports a case of primary cancer of the urethra which originated from the mucous membrane of the urethra. The tumor was separated from the skin by a wide interval, and did not extend beyond the perineal portion of the urethra in any direction. The tumor occurred in a man who had suffered from gonorrhœa, and who had also had an abscess in the perineum. The case was treated as an abscess at first, and the tumor was found on a second operation for its relief. Microscopic examination showed it to be a small, cylindrical-celled cancer.

Sigmoido-Proctostomy : Anastomosis of the Lumen of the Sigmoid Flexure through the Lateral Wall of the Rectum at the Pelvic Floor without Suture. (*Mathew's Medical Quarterly*, July, 1895.) By Howard A. Kelley, M.D., of Baltimore.

The operation was done for the relief of an artificial sigmoid anus, consisting in the anastomosis of the sigmoid flexure into the lower part of the rectum on the pelvic floor by means of traction sutures passed through the severed sigmoid, pulling it into a slit in the rectum, and bringing it out at the anus. The operation was begun by dissecting out the entire scar on the abdominal wall containing the sigmoid and rectal orifices ; these were then separated and each wrapped separately in gauze and laid aside. The incision was now lengthened and the enucleation of the inflamed pelvic structure begun. Three centimetres of the upper part of the strictured rectum were removed, severing it below a rupture in its walls and then approximating the wedge-shaped flaps with silk sutures, and closing its lumen. This rested on the right side opposite to the second sacral vertebra. The end of the sigmoid was then caught with six long, silk traction-sutures passed through the peritoneal and muscular coats, enter-

ing about one-half centimetre from the edge of the incision and emerging on the incision within the mucosa. The walls of the bowel were from three to four millimetres thick, and were somewhat rigid. An oblique incision was made into the rectum on the pelvic floor, just above and behind the vagina, close to the cervix, and below the lower end of the stricture. The incision was about three centimetres long, was directed from before backward and from left to right, and was made through the abdominal incision. A pair of long artery-forceps was then passed through the anus and ampulla and out through the incision in the rectum, and the traction-sutures were caught in a bunch, pulled down and out of the anus, thus drawing the sigmoid into the rectal incision. The bowel was kept from slipping back into the pelvis by grasping the sutures in the heel-bite of the forceps as they lay in the gluteal furrow across the anus. A rectal examination showed that about one centimetre of the sigmoid projected into the rectum. The fit of bowel into bowel at the incision was so snug that the line of division between the sigmoid and the rectum could not be detected. No sutures were used between the sigmoid and the rectum. The pelvis was irrigated and packed with gauze, and the incision in the abdomen was closed except at the point at which the gauze protruded. After the operation, fæcal matter at no time passed by any other than the natural route.

Erasion, Excision, and Amputation in Joint-Disease. (*Journal of the American Medical Association*, August 3, 1895.) By De Forest Willard, M.D., of Philadelphia.

When operative measures are demanded, erasion is the preferable procedure, as it gives less subsequent deformity and results in better locomotion. This operation is especially applicable at the ankle, wrist, and shoulder, frequently at the knee and elbow, rarely at the hip.

Excision is most useful at the hip. It is also largely employed at the knee and elbow; more rarely at the other articulations.

Amputation should be employed in rapid and extensive degenerations at the ankle, knee, wrist, elbow, and in old hip cases which have relapsed after excision.

In children, the less mutilatory operation should be first employed, even though repetition is required; but in adults, temporary operations are seldom advisable.

The necessity for operative treatment in joint-disease arises from neglect of proper mechanical measures. Protection and fixation of the joint in the early stages of tuberculous invasion will nearly always result in a cure with a movable joint and good function. These measures together with anti-bacillary injections and cataphoretic in-driving of iodoform are steadily decreasing the number of cases demanding operation. Motion and traumatism are the chief causes of inflammatory complications in tuberculous osteitis, and often result in such an amount of suppuration and loss of bone as to demand removal of the diseased tissues.

A Report of Fourteen Cases of Dislocation of the Ulnar Nerve at the Elbow. (*American Journal of the Medical Sciences*, October, 1895.) By H. R. Wharton, M.D., of Philadelphia.

The author reports a case of dislocation of the ulnar nerve so that it could be felt as a cord lying in front of the internal condyle of the humerus. Thirteen other cases have been reported, and from a study of these the author concludes that the affection is rare when it occurs independently of fractures or dislocations of the bones of the elbow. That it may result from direct violence or from muscular effort causing laceration of the fascia which holds the nerve in its groove at the back of the internal condyle of the humerus. That the symptoms are usually more marked immediately after the injury than at a later period. That very little permanent disability follows. That in very rare instances a neuritis develops. That the nerve should be replaced and retained in position in order to avoid this sequel. That the most satisfactory method of treatment is to expose the nerve and fasten it in a bed, made for it in the fibrous structures behind the internal condyle, by kangaroo-tendon sutures. That treatment by pads and splints does not permanently reduce the dislocation.

Practical Urethroscopy. (*Medical Record*, September 7, 1895.) By H. R. Wossidlo, M.D., of Berlin.

The diagnosis of chronic gonorrhœa is generally based upon the following symptoms: Occasional or constant appearance of a small quantity of muco-purulent or mucous discharge, especially in the morning; filaments in the urine; and principally on the presence of gonococci in the secretion or in the filaments. Microscopical examination of the discharge for gonococci and leucocytes is an effective means of diagnosis and is requisite in every case of chronic gonorrhœa. But the presence of gonococci in the secretion is not constant, and the filaments and discharge may be examined for a long time without finding gonococci. If the patient be then dismissed as cured he may be still liable to infect his wife. The presence of filaments in the urine warrants the conclusion that desquamation and inflammatory exudation are still taking place, but their presence does not prove that the discharge is still infectious. If we remember the evil consequences of gonorrhœa in women as well as in men it cannot be permissible to neglect even one means of confirming the diagnosis. The urethroscope is necessary for the diagnosis of chronic gonorrhœa. The instrument described in the article is the Nitze-Oberlaender urethroscope. The endoscopic tubes are made of silver, having a calibre of twenty-three, twenty-five, twenty-seven, twenty-nine, and thirty-one Fil. Charrière. The light-carrier consists of two wires which conduct the electric current to platinum wires. One of these wires is tunnelled, the other is not, and they both rest on a tunnelled bar, through which cold water circulates. The urethral tube is armed with an obturator, which is straight for the anterior urethra and jointed to assume the shape of a Mercier catheter for the posterior urethra. As accessory instruments are:

a dilating tube with two blades, an endoscopic sound, a capillary aspirator, a spatula for removing mucus from the glands. Instruments for endoscopic treatment are: the endoscopic knife, the endoscopic canula, armed with a syringe for injections into the urethral glands or other orifices, an anterior urethral forceps, an electrolytic sound, and an instrument designed for internal urethrotomy. Before introducing the tube into the urethra, every part of the apparatus should be tested to show that it is in working order. Thorough examination of the urethra depends upon the neat adjustment of all parts of the apparatus. This being in perfect working order, the patient is told to empty his bladder. Any urethral discharge that may be present having been washed away with a syringe, the patient is placed on the examination-chair. If the patient be very sensitive, it will be advisable, before introducing the urethral tube, to inject one or two grammes of a three- or five-per-cent. solution of cocaine. The tubes must be lubricated with ten- or twenty-per-cent. boro-glycerin before passing them into the urethra. In case a stricture prevents the introduction of the tube, it is better to withdraw the instrument and after dilating the stricture to reinsert it. If the meatus be too narrow for the passage of the tube the defect may be remedied by dilatation or meatotomy. After the endoscopic tube is introduced to the bulb, the obturator is withdrawn. All superfluous glycerin, mucus, or blood has to be removed with cotton, twisted round a probe, in order to prevent steam from disturbing the electric light. The urethra being dried, the light-carrier is put into the tube, and the mucous membrane which presents at the end of the tube is examined; successive portions may be examined as the tube and light are slowly withdrawn, taking care to keep it in the urethral axis. The light does not make the tube unbearably hot. The endoscopic appearance of the mucous membrane of the urethra varies according to the calibre of the passage, according to the blood-supply, and according to modifications brought about by the pressure of the endoscopic tube and by the application of cocaine. In looking through the urethroscope the first thing seen is a more or less highly-colored disk of mucous membrane, which, closing over the objective end of the tube, forms a funnel or circle, presenting a rim, a central figure, and an intervening surface. The central figure is the lumen of the urethra, its shape varying from that of a dimple to that of a T-figure. A number of longitudinal folds radiate from the centre of the mucous membrane, and these are of diagnostic importance, their thickness indicating whether or not they are infiltrated and to what degree. In drawing out the endoscopic tube the openings of the urethral glands present as red, depressed specks or small slits, of the calibre of a pin's head, along the roof, the surrounding mucous membrane being normally smooth or slightly elevated. Very prominent or gaping glandular openings surrounded by a deeply-colored mucosa indicate pathological conditions. In studying the anatomical changes of chronic urethritis we find alterations of the epithelial layer and pathological changes of the urethral

glands. The salient histological feature in chronic urethritis is cellular infiltration of the subepithelial connective tissue. In the milder forms we find the subepithelial tissue impregnated with a more or less dense infiltration consisting of mononuclear or epithelioid cells or leucocytes. If these cellular infiltrations cause only a swelling and hyperæmia of the mucous membrane, with no tendency to transformation into hyperplastic connective tissue, the condition is diagnosed urethritis mucosæ. The second form of chronic urethritis is characterized by a denser and deeper cellular infiltration, containing not only leucocytes, but also numerous young connective-tissue cells. The increasing fibrous tissue finally forms a callous cicatricial girdle around the lumen of the urethra. We call this form a real infiltration (*herdinfiltrat*).

The urethral glands are visible in all forms of chronic urethritis. In the milder degrees of inflammation their orifices appear as small red specks with swollen, puffy walls, and now and then a watery, milky, or purulent discharge oozes from them. In the severer forms of gonorrhœal disease the orifices of the glands gape and are often surrounded by a puffy, red, and prominent wall. Urethroscopy of the posterior urethra is contra-indicated in all cases of acute or subacute posterior urethritis, in tuberculous cases, and in hypertrophy of the prostate. The Nitze-Oberlaender urethroscope guides treatment by dilatation and enables the physician to attack localized gonorrhœal foci under guidance of the eye.

Echinococcus of the Thyroid Gland. (*Archiv für klinische Chirurgie*, 1895, xliv., No. 4.)—Henle details a case of echinococcus of the thyroid gland of nine years' growth occurring in a young woman, eighteen years of age, upon which he operated, supposing it to be an ordinary cyst. The wound healed well, but left a complete paralysis of the right vocal cord.

The larger number of these cysts have been found in young people. The author considers diagnosis impossible unless puncture be made. The best method of treatment is incision, removal of membranes and other portions of the parasite, and secondary or even immediate suture.—*American Medico-Surgical Bulletin.*

Statistical Report of Seven Hundred and Three Major Amputations, from the Records of Eight Hospitals of New York City. (*Annals of Surgery*, September, 1895.) By John F. Erdmann, M.D.

These statistics include all cases of single amputations recorded in eight of the largest hospitals in New York during a period of ten years, from January, 1884, to January, 1894. A mortality-rate of 15.5 per centum is shown. The author compares this rate with the mortality found in amputation cases previously collected, and concludes:

That the mortality of single operators is lower than in general hospitals.

That, owing to ignorance of the classes that inhabit our large charity institutions, consent is not easily obtained, in a great number of cases, until

an almost fatal condition is present, and as a result of this condition the mortality-rate is materially increased.

That the mortality-rate in the last few years, owing to improved antiseptic and aseptic technique, has been lowered considerably.

That deaths from secondary hemorrhage have diminished in direct proportion to the perfection of our antisepsis and asepsis.

That age, although a factor in the mortality-rate, does not carry with it at present the great importance of former years.

And, finally, that the prognosis as to recovery from the operation in amputations for disease is much better than in cases of trauma.

The Paraplegia of Pott's Disease treated by Lateral Drainage. (*Rev. d'Orthopedie*, March, 1895.) By Dr. V. Méuard, of Bank-sur-Mer.

The difference in the effect upon the paraplegia in two cases in which this author performed laminectomies, the one in which a tuberculous abscess was opened and drained recovering rapidly and completely, while the other remained unaffected, led this author to draw the conclusion that possibly the difference was due to the opening of the abscess, and that the pressure of the abscess was the cause of the paraplegia, and its drainage would cure this distressing symptom. The theory based upon this reasoning was confirmed by two operations: the first one was in one of the above cases of laminectomy, where the abscess was found and opened, and the paraplegia cured; and the other, in a case upon which no former operation had been performed, and in which there was only opening and drainage. In both cases the paraplegia began to disappear immediately after the opening of the abscess cavity. In further support of the theory and establishment of the utility and efficacy of this operation, the author reports three cases recently operated upon, in detail, in which the paraplegia had existed for a long time before the operation. The immediate result in these cases was, that a few hours after the opening and drainage of these abscesses the patients felt a relief from oppressive feelings and a return of sensation in the lower extremities. The power of voluntary motion began upon the first day and gradually increased, until, at the end of the tenth, fifteenth, and twenty-fifth days respectively, they could stand, and walking became possible. The retardation of sensation disappeared rapidly; the exaggerated reflexes and contractures decreased little by little. The paraplegia in these three cases had existed six, three and one-half, and three years, before the operation. The recovery was, however, as rapid as in the other more recent cases. The author in his operation attacks the osseous seat of the disease and origin of the abscess in the following manner: an incision, two or three inches in length, is made over the most prominent part of the spinal curvature on the side where the greatest area of dulness has been detected. The transverse process on that side is then bared of its periosteum and removed subperiosteally, first from its costal attachment and then torn away as a whole or in fragments from its attachment to the vertebra. The grooved director is then

pushed beneath the periosteum along the lateral aspect of the vertebra until the necrosed bone is touched and the abscess discovered. Pus generally shows itself as soon as the tranverse process is removed; it is then only necessary to enlarge the opening. The persistent and immediate improvement in the paraplegia in all cases, and its absence after ten, eleven, and fourteen months in three cases, are markedly successful results.

Large Urethral Defects and their Treatment by Urethroplasty. (*Wien. Klin. Wochen.*, May 16, 1895.) By Professor V. Dittle, of Vienna.

The author has made a careful study of those cases in which a traumatism arising from a blow upon the symphysis or ascending rami and symphysis of the pubes has produced a solution in the continuity of the urethra without producing a fracture of the bones. For the lesser defects, he advises the passage of an English gum catheter through the urethra into the bladder from the proximal end of the urethra at the point of rupture, and this to be followed by the introduction of the other end of the catheter into the distal portion of the urethra, the fistula being allowed to close by granulation. This method, however, when applied to fistulæ in which there has been a greater loss of urethral tissues, does not succeed, and there remains a cicatrix, and within it a fistula. Simple fastening of the edges of the wound and closure by sutures is hardly ever successful. For larger fistulæ, in which the urethral defect has an extent of over three-quarters of an inch, he advises the following operation, which he performed successfully in a case where there was a defect of over one and one-quarter inches in the bulbous portion of the urethra, there remaining of it only the upper portion and a small part of the sides. An incision was made one-quarter of an inch from the edge of the wound, which was granulated, elliptical in form, having a diameter in its widest part of more than an inch; this incision passed down through the sound skin on the left side, parallel to the granulating surface of the wound, and formed a flap attached at its base along the mucous edge of the fistula, and capable, when laid over on the right side, of covering that side, and bringing the old granulating surfaces in contact. These surfaces were then freshened, and to hold them in apposition till they had united, three silver sutures were passed through the base of the flap, emerging just above the mucous membrane of the fistula on the left side, and entering the right side just above the mucous surface, emerging on the skin of the right side one-quarter of an inch from the margin. When united they formed a deep suture, which included the flap and held the two freshened granulating surfaces in contact; a few joints of silk suture between the silver sutures united the skin. The wound was dressed with a sterile iodoform gauze dressing, the wound made in forming the flap being allowed to heal over by granulation. A catheter was allowed to remain in position after the operation. The process of healing was benign and without fever; the stitches were removed on the twenty-fourth day. There then persisted two minute sinuses at the extremities of the wound,

which healed in eight days. There followed, however, as a complication, an acute suppurative prostatitis, which easily yielded to treatment, the patient making a complete recovery and being able to retain the urine from two to two and one-half hours, and then making a good stream. The author advises the use, at intervals, for some time, of sounds, to overcome the well-known tendency of scar-tissue to contract. A second case yielded equally successful results, and was without fistulæ; there were two flaps formed in this case, one from either side.

Osteotomy of the Tibia for Extensive Osteomyelitis, followed by Compensatory Hypertrophy of the Fibula. (*Revue d'Orthopédie*, March, 1895.) By Dr. Gérard Marchant, of Paris.

In many cases of osteomyelitis of the tibia the bone does not renew itself, and is not strong enough to maintain the weight of the body without the assistance of mechanical appliances.

In the case reported, the tibia did not fill up, but the inconvenience was compensated for by the excessive hypertrophy of the fibula. The patient came under the care of the author, suffering from osteomyelitis in a number of localities, in the most aggravated form in the tibia, where it involved the knee-joint and necessitated the use of osteotomy, extending from the tuberosity of the tibia to about two inches above the lower extremity of that bone. The patient was seen six years after the operation. The leg had a decided curve backward and outward, and was markedly shortened. The knee was very prominent, and examination showed this to be due to the head of the hypertrophied fibula, whose styloid process was on a level with the superior border of the patella, and whose head projected backward and outward, where it had been forced by the development of the tibia and by sustaining the weight of the body. The tibia was flattened and nearly wanting in its middle third, but was normal in the lower third; the foot was in its normal relation. The entire limb was markedly shortened. The fibula was markedly thickened, especially antero-posteriorly. Walking was easy, and the knee-joint could be bent to a right angle.

NEUROLOGY.

IN CHARGE OF LANDON CARTER GRAY, M.D.,
New York City,

GUY HINSDALE, M.D., Philadelphia, AND WILLIAM BROADDUS PRITCHARD, M.D., New York City.

Craniometry and Cephalometry in Relation to Idiocy and Imbecility. (*American Journal of Insanity*, July, 1895.) By Frederick Peterson, M.D.

In a well-illustrated article on this subject the author shows that the circumference of the skull averages fifty-two centimetres in men, and two

centimetres less in women, with a physiological variation from 48.5 to 57.4. The scalp and hair superadd about three centimetres; hence, in cephalometry about six per cent. should be deducted to obtain the measure of the skull. A rough empirical estimate is that where the circumference of the skull is fifty centimetres its volume will be about thirteen hundred and fifty cubic centimetres.

Excessive prognathism is found in criminals, in microcephali, and in cases of hemi- and paraplegia spastica infantilis.

A skull below the normal type in volume belongs to an abnormal individual.

Under typical measurements of the head should always lead us to entertain the suspicion of defective cerebration.

Abnormal smallness of any part of the skull permits the conclusion that the part of the brain in its neighborhood is imperfectly developed.

Excessive development of the head has a double signification. It is always pathological, but may mean abnormality or successful compensation. Wormian bones are also doubly significant. They either represent a pathological process or a successful effort of nature in repair.

Hemiplegia spastica infantilis, epilepsy, and intellectual or ethic weakness often exhibit unilateral aplasia of the skull.

Dr. Peterson gives a condensed table of the thirteen principal measurements for average males and females with physiological variations, and the results of the examinations of nineteen paralytic imbeciles. The greatest transverse diameter was found to be below the normal average in the eleven men, and in all but one of the women examined. The binauricular diamter was lower than the average in all the cases.

The Primary Lesion of Tabes. (*Bulletin of the Anatomical Society*, 1894.) By Dr. J. Nageotte, chief of the laboratory of Professor Raymond, at the Salpêtrière, Paris.

The author speaks of the widely-accepted view of tabes as a degeneration of the posterior roots, with the consequent changes in the columns of Goll and Burdach. The cause of this change has failed to be recognized. Anatomically the close connection of tabes with syphilis has not been noticed as it has been clinically. The explanation of a special action of the poison on the axis cylinder is only eluding the difficulty. Clinically and pathologically there is a close connection between tabes and general paralysis, but the morbid process of the two is very different: the first is confined to certain systems in the cord; the second is diffuse and vascular.

Professor Raymond has recently shown that the primary lesion of general paralysis is constituted by an accumulation of embryonic cells of a connective-tissue origin in the course of the brain capillaries; often this is of a purely inflammatory type, occasionally it is shown to be syphilitic.

Dr. Nageotte has attempted to find a similar lesion in the cord of tabes. The theory of Obersteiner and Redlich, which ascribes the trouble to a

meningitis at the point of entrance of the posterior roots into the cord, finds no acceptance with him. He has studied four cases,—one of pure general paralysis, two of recent tabes with general paralysis, and one of pure tabes. In the case of pure general paralysis there had been no tabetic symptoms, nor was anything noticed in the lumbar cord, yet in the sacral roots initial lesions were found, and in the dural cord a slight band of sclerosis near the posterior horns of both sides. In the three clearly-marked cases of tabes perineuritis and mesoneuritis existed, exactly limited to the space between the ganglion and the entrance of the roots into the arachnoid cavity. These consisted at an early stage in an embryonic infiltration, which later developed into sclerosis.

The location is, according to Dr. Nageotte, of great importance. The anterior and posterior roots join shortly before leaving the dural sac; the arachnoid here forms a common sheath, which is at first loose, farther on closely applied; the united nerve-bundle then enters a diverticulum of the dura, which soon becomes firmly united to the arachnoid sheath; still farther the posterior root enters the spinal ganglion. It is this region of ten to fifteen millimetres in the sacral portion of the cord in which the primary lesion of tabes is found. Here the two roots constitute one nerve, surrounded by a lymphatic space and with a sheath, and here a tranverse neuritis, either by compression or by irritation, or by both, leads to degeneration of the sensory fibres.

In transverse cuts at this region a proliferation of round cells exists about the nerve-bundles, with an external band of sclerosis; at other portions this round-cell infiltration is found between the elementary fibres, and later in the process becomes sclerotic; even empty spaces are found here. In this manner the individual nerve-fibres are strangled. The fibrous envelope of the united roots is thickened and contains embryonic cell-masses. The arteries of this region are sound, but the veins show this same infiltration, and offer a striking analogy with the syphilitic meningitis.

The anterior roots are always less invaded, and without appreciable degeneration.

Above and below the small area described all these alterations cease.

In the case of tabes of long duration these lesions mentioned have attained a marked degree of development, and the sclerosis has the chief place.

The absence of this infiltration at other points of the same posterior roots, where these roots are equally degenerated, and the existence of it in the case of general paralysis, where the parenchyma of the roots was sound, are proofs of its primary nature.

In cases of tabes such as the one described by Raymond, where the posterior roots were comparatively sound, attention is called to the fact that a nerve-fibre always degenerates at first at its periphery, which in tabes is in the posterior column of the cord. The lesions in the spinal ganglion are secondary, similar to the destruction of the cells of origin after section of motor nerves.

It is probable that the anterior roots are much more resistant than the posterior, but the infiltration of minor grade can be used to explain the existence of a motor neuritis.

The process is of connective-tissue origin, is probably infectious, and of the same nature as the lesions of general paralysis. The syphilitic origin cannot be demonstrated, but the whole process, especially the presence of periphlebitic nodules, is a strong argument in favor of syphilis. The singular location cannot be explained.

Successful Suture of the Musculo-Spiral Nerve Three Months after its Complete Division. (*Therapeutic Gazette*, July, 1895.) By Wharton Sinkler, M.D.

The patient, a man aged twenty-six, was stabbed three inches above the elbow, dividing the musculo-spiral nerve. There was complete wrist-drop. Tactile sensation was preserved over the entire hand with the exception of an area on the posterior and inner aspect of the thumb extending from the carpo-metacarpal articulation to the last phalangeal joint. Reaction of degeneration marked. Dr. Keen operated three months after the accident. The bulbous portion of the nerve at the seat of injury was excised, and the extremities were stretched and sutured. After five months of persistent treatment by galvanism signs of improvement were noted and function was gradually restored. The history of this case shows how much perseverance with galvanism can do to effect a cure.

The Alterations of the Mental Reading in those afflicted with Cortical Motor Aphasia. (*Society of Biology*, July 6, 1895.) By Déjérine and Mirallié.

In the cortical motor aphasia the agraphia is due to the alteration of the conception of the word; the same is true of the disturbance in the mental reading in lesions limited to the convolution of Broca, as indicated by Trousseau.

To avoid any deception on the part of the patient the following tests may be employed to reveal the mental alexia:

1. A written or printed word is presented, and the patient required to designate the object indicated.

2. After the perusal of an article the patient is called upon to describe what he has read by gestures and such words as he may have at his disposal.

3. The patient is requested to give a response to a written question.

4. After speaking some word in a loud voice the patient is told to find this word on a printed or written page.

5. A false sense is given to a word shown to the patient, who is then asked if the correct sense has been given.

In all the eighteen cases examined there was more or less disturbance in the mental reading. The degree of alexia varied with the patients; some

recognized isolated words, but not phrases; others did not even recognize the separated letters. In proportion to amelioration of the motor aphasia the comprehension of printing and writing returns, and, as a rule, the ability to read is restored before spontaneous speech.

In the cases mentioned the alexia has lasted from a few months to six years.

There is no relation between the degree of motor aphasia and the alexia; a mild and temporary motor aphasia involves alexia, just as a permanent motor aphasia does; on the contrary, the cortical motor aphasia has no connection with word-deafness. MM. Déjérine and Mirallié deny the existence of independent centres corresponding each to one of the parts of speech. There is a speech area, occupying the foot of the third frontal convolution, the angular gyrus, and the first temporal convolution. In this area secondary centres exist,—centres for the motor image of articulation, for the visual and the auditory images, and these are united by fibres of association. All lesions of any point whatever of this zone involve in the internal division of speech an alteration of the idea of the word, and according as one or the other of these centres is destroyed one of the special forms of aphasia will be produced, but with disturbance also in the function of the other centres of speech. The earlier a centre has developed the more resistant it is; such is the case for the auditory centre of words, which is never impaired in its functions as a result of a lesion in the convolution of Broca, whereas this latter is always functionally involved when the auditory centre is destroyed. Writing is the last form of speech acquired by education, and is only a copying of the optic image of letters; it is, therefore, altered in all forms of cortical aphasia.

Thomas and J. C. Roux described their examination of seventeen cases of cortical motor aphasia, taken from the fifty or so patients in the service of Professor Déjérine, afflicted with loss of speech from cerebral trouble. All could read mentally, and the reading appeared only at first sight fully normal. When the separate letters of a word were given to one of these patients she was unable to reconstruct the word. With the exception of two persons, who had recovered, all were unable to read every word. Only four, in whom the speech was entirely restored, were able to write.

Thomas and Roux concluded that the ability to read returns in the following order: First, the design of the word is recovered, then the association of the syllables which form the word, then the letters which form the syllables. The order is, therefore, inverse to that followed by a child in learning to read. W. G. S.

The Action of Infectious Diseases upon the Spinal Cord. (*Centralblatt für Bakteriologie und Parasitenkunde*, October 5, 1895.) By Grasset and Vaillard.

A certain relation exists between the infectious diseases and diseases of the spinal cord, which can be discovered only through an autopsy. All of

the infectious dieases can, in their various stages, produce some disease of the spinal cord. The clinical picture varies within certain limits with the kind of infection. The micro-organism or its toxin many times causes a secondary infection of the spinal cord, occurring in the course of the infectious disease. A neuropathic predisposition tends to cause spinal-cord infection. The effect of the bacteria or their toxins on the spinal cord is analogous to that of various vegetable and mineral poisons. Some infectious diseases act only on the nervous system.

Crocq produced diphtheritic myelitis in rabbits with cultures of the Klebs-Loeffler bacillus or the filtrate. Henriquez and Hallion caused, by the action of the diphtheria toxins on apes, a disease which bore the clinical picture of acute anterior poliomyelitis. Ballet and Lebon, Ausset, Mayet, and Mosse found that various kinds of spinal affections could be produced in animals by the staphylococcus and streptococcus. Bouchard reports a case in which the pyocyaneus caused a hemorrhage into the spinal cord. Sabrizes and Mongour obtained a streptococcus from a case of icterus catarrhalis levis which caused atrophic paralysis of the extremities in animals. Roger relates a case of poliomyelitis due to the toxin of the streptococcus with atrophy of the ganglion-cells of the anterior horns. Cassaet reports a case of myelitis following beri-beri. Mosse, Weill, and Regaud report cases of affections of the spinal cord and peripheral neuritis with the grippe. Marinesco demonstrated, by a section of a spinal cord in a case of small-pox, streptococci in the central canal, abscess of the cord and its roots, meningomyelitis tuberculosa. Vincent found thrombi in twenty-eight out of three hundred and forty cases of typhoid fever, which on section revealed the staphylococcus pyogenes aureus and albus. These organisms were also found in the blood during the period of fever.

On so-called "Congenital Chorea." (*American Journal of the Medical Sciences*, October, 1895.) By George F. Johnston, M.D. (Edin.), M.R.C.P. (Lond.), of London.

The disease to which the term chorea has come to be almost entirely confined—viz., chorea minor or Sydenham's chorea—is essentially a disease of childhood, the vast majority of cases occurring between the ages of five and fifteen. But common though it be in childhood, it is very rare, indeed, in early infancy, very few cases having been recorded under four years of age. From time to time, however, accounts appear in the medical journals of instances of "congenital chorea." A case occurring in the practice of the author aroused his interest in the whole subject of congenital chorea, and raised the question whether cases really do occur which can fairly be classed as examples of this condition or whether all recorded cases are not rather to be regarded as the result of irritative lesions of the cortical motor areas in the brain, and not as due to a merely functional instability of those centres such as presumably exists in true chorea minor. In all cases except one the disease has been of an essentially chronic nature,

lasting for years or persisting through life, and this seems sufficient reason for separating the disease from Sydenham's chorea, the duration of which is usually to be measured by weeks, and when apparently indefinitely prolonged there are marked variations in the violence of the choreic movements which would suggest a series of relapses. In the cases of so-called congenital chorea, on the other hand, the movements either remain apparently unaffected by the lapse of time or there is a gradual improvement up to a certain point, though complete cessation of the movements has not been recorded, and in a few cases the disease has seemed to be progressive. The case occurring in the author's practice had been choreic from birth and presented movements such as are met with in ordinary chorea. When presented as a case of congenital chorea before a medical society, the movements changed and presented the typical picture of athetosis. A lesson to be drawn from this case is that there are no hard-and-fast lines to be drawn between the movements of congenital chorea and athetosis. We are justified in concluding that there are strong reasons for believing that all the cases of congenital chorea have really been cases of double athetosis in its choreic form. An attentive examination of the abstracts of recorded cases will show that the existence of true congenital chorea is extremely doubtful, and that all the cases thus far reported, with probably one exception, are examples of double athetosis due either to developmental defect or to meningeal hemorrhage injuring and irritating the motor cortex.

OPHTHALMOLOGY.

IN CHARGE OF CHARLES A. OLIVER, A.M., M.D.,
Philadelphia, Pennsylvania,
AND
EDMUND LANDOLT, M.D.,
Paris, France.

Cataract Operations between the Ages of Eighty and Ninety, with a Table of Cases. (*Boston Medical and Surgical Journal*, September 26, 1895.)

In a brief but valuable paper upon this subject, Hasket Derby, of Boston, Massachusetts, says, "This being a fairly common affection of latest life, and the only method of treatment as yet known to science being operative removal, the extent to which age should influence our prognosis becomes a very practical question." He properly tells us that it would be difficult for one unfamiliar with the subject to realize how much both patient and family physician are apt to be misled by the feeling that the operation for cataract is not worth undertaking after a certain age. He says that, while the chances of success are popularly underestimated, the effect of the operation and confinement on the patient's general health are apt to be unduly exag-

gerated, and many an individual has spent his closing years in blindness which might have been greatly alleviated, if not entirely removed.

In his experience, patients of eighty and upwards form a very inconsiderable proportion of the cases of cataract that come within the experience of the average ophthalmic surgeon in New England. He has found that, according to his estimate, they amount to about six per cent. of the whole number. He remarks, however, that it would seem that six per cent. of total failure, large as it would be between the ages of sixty and seventy-five, as contrasted with eighty-five per cent. of success, does not form a valid reason for denying the operation to those advanced in years. He believes that the use of cocaine renders ether unnecessary, and says that the senile eye is, moreover, much less sensitive than in youth or even middle age. Under ordinary circumstances he has found that the confinement lasts but a fortnight, the patient remaining in bed only the first day. In conclusion, he justly asks whether, with a prospect of the recovery of sight as good as these figures show, it is right to allow a fellow-being to pass the last years of life in blindness, deterred from the operation by an unreasonable dread of the effect of extreme age on the result?

On Erythropsia. (*Ophthalmic Review*, August, 1895.) Based upon personal observation and studies among patients and friends, Fuchs, of Vienna, says, "According to our experiments, therefore, we may state that the erythropsia of normal eyes, as well as of eyes deprived of their lenses, is caused by dazzling, which need not be disagreeably strong, but must be of long duration. Exposure to sunlight reflected by snow is the most effective means of producing it; for most normal eyes it is, moreover, necessary that the dazzling shall take place at a certain height above the level of the sea. The sunlight is there stronger and also richer in short-waved rays. The production of erythropsia is facilitated by dilatation of the pupil, and still more by absence of the lens.

"I believe that the latter protects the retina from dazzling by rendering the light passing through it poorer in short-waved rays. Helmholtz has stated that these are absorbed by the lens in a higher degree than the other rays. Still more is this the case when the lens grows yellow by age. Finally the lens transforms, by its strong fluorescence, short-waved rays into those of greater length. That the erythropsia has its origin in the retina is proved by the fact that, if only one eye be exposed to the dazzling, the erythropsia limits itself to this eye, and that it may be even unequal in the different parts of the field according to the different degree of dazzling."

He explains the condition by the supposition that the retinal purple becomes visible. This, he says, is usually not perceived, because it is always present in the retina, just as we cease to see red if a red glass is worn before the eyes for a long time. By long exposure to strong light, however, the retinal purple is bleached and the retina becomes uncolored. If we now

pass into a dark room, the purple begins to regenerate and become visible. The modern view is that the cones are the organs perceiving the colors. The cones contain no purple, but they are surrounded by purple-colored rods, and the prolongations of the pigmented epithelial cells protruding between the cones and rods contain purple. In this way the cones may be illuminated by purple-colored light from the sides.

Pleading for the retinal purple theory he mentions the following facts:

(α) The erythropsia is not produced by short dazzling, even if the dazzling be strong enough to be painful, but only by prolonged exposure to light, such as would bleach the retinal purple.

(β) The color of the erythropsia is exactly like the color of the retinal purple.

(γ) The erythropsia is as a rule less pronounced or entirely absent in the part of the field of vision which corresponds to the macula lutea.

(δ) The erythropsia is also perceived if, after exposure to light, the eye is bandaged for five or ten minutes and then reopened.

Practical Points gained in the Treatment of One Thousand Cases of Insufficiencies of the Ocular Muscles. (*Journal of the American Medical Association*, November 9, 1895.)

In a timely and intensely practical article upon this subject, J. Walter Park, of Harrisburg, Pa., gives the following summary of his own views upon such cases in the following words:

1. That following up one's cases for one to two years is necessary, and should be done in all muscular insufficiencies, to tabulate results for publication.

2. Those cases involving the recti muscles, occurring in hyperopia and compound hyperopic astigmatism of from 5° to 15°, combined with errors of refraction, will generally all do well with their refractive errors corrected, muscular exercises, out-door life, tonic treatment, and the temporary use of prisms.

3. Those occurring in myopia and compound myopic astigmatism require the use of prisms more constantly, and are not benefited quite as much by muscle-exercising as those occurring in hyperopia, etc. Tenotomies with advancements are generally more effective than in hyperopic cases.

4. Those occurring in constitutional, paralytic, and reflex cases require plenty of rest, out-door exercising, the temporary use of prisms, electricity, and general tonic treatment.

5. Tenotomies are not necessary in most cases, and should not be done until all other remedies fail.

6. There are some cases of esophoria of slight degrees of deviation that require nothing but rest and out-door exercise to effect a cure.

OBSTETRICS AND GYNÆCOLOGY.

IN CHARGE OF RICHARD C. NORRIS, M.D.,

Lecturer on Clinical and Operative Obstetrics in the University of Pennsylvania; Obstetrician-in-Charge, Preston Retreat; Visiting Obstetrician, Philadelphia Hospital; Gynæcologist, Methodist Episcopal Hospital; Consulting Obstetrician and Attending Gynæcologist, Southeastern Dispensary and Hospital for Women and Children.

Contracted Bladder treated by Graduated Fluid Dilatation. (*British Gynæcological Journal*, August, 1895.) By Mayo Robson, F.R.C.S.

In a patient presenting symptoms of vesical calculus a sound was passed in order to determine the size of the bladder. As soon as the sound entered the bladder it impinged against hard calcareous material, and bimanual examination revealed the fact that there was practically no bladder, that organ being merely represented by a small hard lump about the size of a walnut. The urethra was dilated and phosphatic concretions lining the minute cavity were scraped away. The bladder was then found to hold only one-half ounce of fluid. There was incontinence of urine both before and after the operation. The bladder was irrigated with boric acid solution daily, and on each occasion the urethra was compressed around the nozzle of the syringe and moderate force was used to increase the capacity of the organ. In a few days incontinence ceased. Later, ether was given and the bladder was distended with boric acid solution, and it was found that the capacity had increased to two ounces. A later dilatation without ether started up some vesical irritability; but, in spite of this fact, improvement continued, and the patient was discharged with a bladder able to hold eight ounces of urine, which was normal. In this case, as in all cases in which there is no contra-indication, salol and boric acid, each five grains, were given three times daily. The use of these drugs has done much to abolish post-operative urinary fever.

Suspensio Uteri. (*Annals of Gynæcology and Pædiatry*, August, 1895.) By Howard A. Kelley, M.D., of Baltimore.

The indications for suspension are a retroflexion which cannot be corrected, and whose symptoms cannot be relieved by non-operative treatment, and another class of cases in which, although the uterus may be sharply retroflexed, the chief complaints are often referred to other organs and the patient is neurasthenic or hysterical.

After making the incision in the median line the uterus is brought forward against the anterior abdominal wall. One side of the incision is then lifted with two fingers, and the peritoneum and subperitoneal fascia are caught up with a curved needle carrying the suspensory ligature, passing into the tissue to about a depth of two millimetres, and catching up in the bite a length of about two centimetres. The same ligature is then carried through a part of the uterus on its *posterior* face below the fundus, and,

finally, through the peritoneum and subperitoneal fascia of the opposite side. The ligature is drawn tight and tied, bringing the uterus tightly against the anterior wall. A second suture is introduced, and a third if necessary, passing each suture a little above the previous one.

In one hundred and seventy-one cases operated on no death has occurred, and in only one case has the uterus returned to its old position. Six of the patients became pregnant after the operation, and in no one of them was there any extra discomfort during the time, and the uterus remained in anteposition after childbirth.

Fœtal Hiccough. (*Chicago Medical Recorder*, August, 1895.) By Joseph B. DeLee, M.D., of Chicago.

Singultus has been observed in the child in utero for many years. The author has recently seen two cases. He thinks that no pathological significance can be attached to the phenomenon. It has been observed as early as the seventh month and up to and during labor. Active movements on the part of the mother may cause an attack, and likewise prolonged and rough palpation; but the attacks may also occur during the woman's sleep.

Hink observed an attack of hiccough in a deeply asphyxiated child, unattended by the usual sound, and after removing some mucus from the trachea the child had another attack, attended by the usual characteristic noise. He concludes from this case that there is a kind of singultus without the passage of air through the glottis, and that, therefore, this phenomenon can occur in utero.

This movement can be distinguished from others by its position over the back and shoulders of the child; by its frequency, about every four seconds, which excludes fœtal or maternal pulse; and by the suddenness of the motion, its jerky character, and short sound, which distinguish it from partial contraction of the uterine or abdominal muscle.

Dermoid Cysts and Pregnancy. (*American Journal of Obstetrics and Diseases of Women and Children*, vol. xxxii., No. 2, 1895.) By Barton Cooke Hirst, M.D., of Philadelphia.

This rare complication of pregnancy shows in the case reported how closely a pelvic tumor with intra-uterine pregnancy may simulate in its clinical aspects an extra-uterine gestation.

The patient had, for eight months subsequent to a miscarriage at two months, slight pain and soreness in the left groin from time to time. The menses did not appear when due, about March 22. About a week later she went on a journey and took a severe cold. Coughing produced sharp pain in the left groin, and severe attacks followed, especially after defecation or urination, later small quantities of dark blood were discharged. On examination a cystic tumor filled Douglas's pouch on the left side, pushing the uterus against the symphysis. An operation showed a dermoid cyst on

the left side, the size of a cocoanut, with two large bunches of hair in it. One twist of the pedicle. Intra-uterine pregnancy. An afebrile convalescence followed, and the pregnancy was uninterrupted.

PATHOLOGY.

IN CHARGE OF ALLEN J. SMITH, A.M., M.D.,
Professor of Pathology in the Medical Department of the University of Texas, Galveston, Texas,
AND
HENRY W. CATTELL, A.M., M.D.,
Demonstrator of Morbid Anatomy in the University of Pennsylvania; Prosector to the American Anthropometric Society; and Pathologist to the Presbyterian Hospital, the Institution for Feeble-Minded Children at Elwyn, etc.

Tubercle Bacilli in Milk. (*Hygienische Rundschau*, October 1, 1895.) By Kuno Obermüller, M.D.

This author has made two sets of experiments on animals with the object of finding whether the mixed milk, as found in the markets, contains tubercle bacilli. In the first set sixty animals were used, forty being inoculated in the peritoneum with two to two and a half cubic centimetres each, and the remaining twenty being used as control animals and inoculated with sterilized milk. Young, healthy guinea-pigs of about three hundred and fifty grammes weight were used. Of the forty, three died of a high grade of tuberculosis and eight died within eight or ten hours after injection. From the organs of the latter a pathogenic bacterium was isolated.

The second series of experiments was very interesting. By testing centrifugalized milk, the author found that many bacteria were not carried by their specific gravity to the bottom of the vessel, but remained entangled in the layer of cream. In accordance with this evidence he inoculated animals with one to one and a half cubic centimetres of a mixture of cream and sediment. The results were as follows: thirty-eight per cent. of all animals injected were tuberculous, and thirty per cent. were very much emaciated and died of a high grade of tuberculosis. Of nine control animals one died of peritonitis.

Pearlsucht is seldom seen in animals living on the meadows, but in the so-called "zuckervieh"—the stall-fed cattle—a high grade of tuberculosis is often seen. The author thinks that the sterilizing of milk and sanitary measures in regard to butter and milk are only palliative, and that the root of the evil must be attacked by testing with tuberculin and destroying all infected animals.

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

AN ACTION FOR MALPRACTICE AGAINST A PHYSICIAN — A WAIVER OF THE BENEFITS OF THE STATUTE PRIVILEGING CONFIDENTIAL COMMUNICATIONS.

THE privilege conferred by the statutes freeing from disclosure the information imparted by a patient to his physician, necessary for his treatment, is for the benefit of the patient only and not the physician. Such privilege may, however, be waived by the patient, either in express terms or impliedly by a course of conduct, which the courts, in construing these statutes of privilege, have declared to amount to a waiver. And it has accordingly been decided that, in bringing an action for malpractice against his physician, the patient forfeits his right to have the secrets of the sick-room preserved inviolate in such judicial proceeding.

In a recent case, which was an action by a patient against his physician to recover damages for malpractice, which consisted in failing to properly treat and set a dislocated hip, the evidence showed that the defendant, on December 19, 189–, the day of the injury, was called in and undertook to treat it; and, after making a slight and insufficient examination, he concluded that the injury was a mere bruise, prescribed some liniments for it, went away, and did not return until specially called, ten days afterwards. At this time the hip was dislocated, the known and well-marked symptoms of a dislocation were present, and the surgeon's attention was called to them, yet he made only a slight examination, and still failed to discover the dislocation. On January 2, however, he did discover the dislocation, and made an unsuccessful attempt to reduce it.

There was also evidence in the case tending to prove that after the appellant had treated the appellee for about two months, it being apparent that his treatment was not proving successful, he recommended that the patient should go to the city of A., where the surgeons were better prepared and equipped to treat such cases; that the defendant went with the plaintiff to that city, and Doctor M. and others, assisted by the defendant, made a careful examination of his condition, and advised him as to the proper course to be pursued. In his defence the defendant offered to prove by himself and Doctor M. what occurred at this examination, and the condition and nature of the patient's injury at this time. To this the plaintiff

objected, on the ground that these were confidential communications, and the evidence was rejected, his counsel seeking to sustain the ruling on this ground, and also on the ground that the evidence offered was as to matters occurring entirely subsequent to the defendant's treatment, of which complaint is made, and disconnected therewith.

There was a verdict for the plaintiff for fifteen hundred dollars; but the Supreme Court reversed a judgment entered therein, and instructed the trial court to sustain the defendant's motion for a new trial.

In a former case[1] the Supreme Court had said, "If a patient makes public in a court of justice the occurrences of the sick-room for the purpose of obtaining a judgment for damages against his physician, he cannot shut out the physician himself nor any other who was present at the time covered by the testimony. When the patient voluntarily publishes the occurrence, he cannot be heard to assert that the confidence which the statute was intended to maintain inviolate continues to exist. By his voluntary act he breaks down the barriers, and the professional duty of secrecy ceases. It would be monstrous if the patient himself might detail all that occurred, and yet compel the physician to remain silent. The principle is the same whether the physician called is a consulting physician or is the defendant. The opening of the matter to investigation removed the obligation of secrecy as to all, not merely as to one. When the obligation to silence is broken it is broken for the defendant as well as for the plaintiff. As to all witnesses of the transaction it is fully opened to investigation, if opened at all, by the party having a right to keep it closed. A patient cannot elect what witnesses shall be heard and what shall not; for if once investigation legitimately begins it continues to the end. A patient may enforce secrecy if he chooses, but where he himself removes the obligation he cannot avail himself of the statute to exclude witnesses to the occurrence."

And Mr. Justice Gavin, after adopting the law as above laid down, went on to say in reference to the consultation with Doctor M., "Nor can it be successfully asserted that the defendant should not go into this particular transaction because it was disconnected with the remainder of his treatment, and because the plaintiff had not gone into it himself. According to the defendant's theory of the case, as supported by some evidence at least, this examination and consultation with Doctor M. were but additional steps in the effort to accomplish what defendant had all the time been seeking, the cure of the plaintiff. It was not permissible for the latter to select out certain portions of the defendant's treatment, or certain visits and examinations, and by detailing them, limit the defendant's evidence to those particular occurrences."

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[1] Lane *vs.* Boicourt, 128 Ind. 420.

BOOK REVIEWS.

STUDENTS' AID IN OPHTHALMOLOGY. By Gertrude A. Walker, A.B., M.D., Clinical Instructor in Diseases of the Eye at the Woman's Medical College of Pennsylvania. Forty illustrations and a colored plate. 8vo, pp. 183. Philadelphia: P. Blakiston, Son & Co., 1895.

This little work, as its title and preface tell us, is intended as a preliminary aid to the study of one of the most important branches of medicine, ophthalmology.

Considered in this manner—the only one that a practical teacher can assume for a just criticism of such a work—the reviewer unhesitatingly recommends it as one of the best and one of the most useful pieces of bookmaking that he has seen. The subject-matter is considered logically and is well handled. There is an utter freedom from technicality and uncertainty. The sentences are crisp and easily understood, and there is nothing that is useless,—so that any reader, who knows how to read, must obtain the information that the author desires to impart. She is to be congratulated, and we hope that she will be rewarded by a large and a speedy sale of this her first endeavor in literary ophthalmology. C. A. O.

SCIENCE AND ART OF OBSTETRICS. By Theophilus Parvin, M.D., LL.D., Professor of Obstetrics and the Diseases of Women and Children in Jefferson Medical College, Philadelphia. New (third) edition. In one octavo volume of six hundred and seventy-seven pages, with two hundred and sixty-seven engravings and two colored plates. Cloth, $4.25; leather, $5.25. Philadelphia: Lea Brothers & Co., 1895.

In this, the third edition of Professor Parvin's excellent work, the author has without doubt attained the object desired,—namely, "to give a faithful reflex of obstetrical science and art at the present hour." The book is by no means bulky, yet complete in every department, and contains all the necessary detail required by the modern practising obstetrician. Throughout, many extracts from the writings of eminent authorities on all subjects are appended, giving the work almost the value of a system and lending additional interest to the subject-matter in consideration.

Part I. treats of the "Physiology of Pregnancy, Labor, and Puerperal State," including full chapters on the anatomy of the pelvis, sexual organs, embryology, management of pregnancy, mechanism and conduct of labor, etc. Part II. deals with the "Pathology of Pregnancy, Labor, and Puerperal State." In this latter part Dr. Parvin has given a most lucid explanation of the obstetrical operations, their indications and results. The chapter on "Forceps" we think especially complete, and many practical suggestions are offered for physicians, both young and old. Great stress is laid on the importance of strict asepsis in obstetrical work, and considerable space is devoted to the various complications following infection, comprising the best part of Part III. of the book. When treatment is indicated, Dr. Parvin is explicit in his directions, the remedies suggested being those which have given the best results in his own practice, and while the experience of other obstetricians is never disregarded, the doctor has, we think, quite properly eliminated that host of prescriptions which are usually inserted, and which prove so unnecessary and confusing to the practitioner.

On the whole, the book deserves our highest praise; we consider it one of the most comprehensive of its class published, and take pleasure in recommending the same to students and to physicians. R. S. J. M.

A Text-Book on Nervous Diseases, by American Authors. Edited by R. X. Dercum, M.D., Clinical Professor of Diseases of the Nervous System in the Jefferson Medical College, Philadelphia. With three hundred and forty-one engravings and seven colored plates. 8vo, pp. 1052. Philadelphia: Lea Brothers & Co., 1895. Cloth, $6.00; leather, $7.00.

Dr. Dercum and his associates are to be congratulated upon the exceedingly creditable and satisfactory work they have accomplished in the preparation of "A Text-Book on Nervous Diseases, by American Authors." It is a finished and worthy production both from a patriotic and a clinico-scientific stand-point. It is to be hoped, however, that the apparently limited geographical area productive of American neurologists, as indicated in the conspicuous fact that not a single contributor appears from west of the Alleghanies, may not prove a thorn in the flesh of the many good men pursuing that specialty, and not without reward, in our Western and Middle States. The editor, doubtless, has some excellent reason, and yet it seems to me the term American neurologists is misleading when it fails to include such names as Bremer, of St. Louis; Riggs, of St. Paul; Lyman and Brower, of Chicago, and others who might be mentioned. Beyond this fact there remains little to criticise adversely.

The rather unusual order of presenting the different subjects is explained by the editor, in his preface, as having been arranged with the idea that a thorough knowledge of nervous disease was more easily attained thereby, general diseases being considered first and special diseases, with the facts of associated anatomy and physiology, coming afterwards. That such an arrangement does, in any degree, simplify the general subject seems to the writer exceedingly problematical. Superficially considered, it suggests the cart before the horse.

Chapter I. is devoted to general considerations applicable in diagnosis, with more or less elaborate interpolations of various symptomatic phenomena observed. The widely recognized skill and authority in matters of expert neurological diagnosis, of both Drs. Mitchell and Dercum, who jointly write this article, explains, perhaps, the writer's somewhat disappointed impression after reading it. The general considerations presented are the trite and well-worn data of ordinary neurological teaching: anticipated originality is conspicuous by its absence. This chapter also contains a descriptive presentation of ocular phenomena which are in relation to nervous disease, by Dr. C. A. Oliver, who discusses a very interesting subject instructively and with commendable clearness.

Chapter II., on neurasthenia, by Dercum, is one of the best in the book. The term neurasthenia has been heretofore universally credited to Dr. Beard in its present application; an error, it would appear, since another American, Dr. E. H. Van Deusen, of Kalamazoo, Michigan, used the word as a synonym for nervous exhaustion in a paper published in 1867, two years before Beard's first contribution to the subject. Dercum considers, and we think justly, a vitiated heredity as the first and most important etiological factor. In his description of the psychical disturbances observed in this affection, he approaches dangerously near, if, indeed, he does not cross the border-line of insanity, nor am I sure but that these patients really belong and should be classed as among the medically insane. The author adopts the theory of functional cellular exhaustion, as illustrated in the recent experimental researches of Hage, as the essential pathology of this condition, rather neglecting the more easily sustained doctrine of auto-toxæmia. He regards the prognosis as always uncertain, but usually good. Rest, massage, electricity, hydrotherapy, diet, and environmental influences constitute the important elements in treatment. He has found a positive effect for good from the use of certain of the animal extracts and the nucleins.

The next chapter, upon the somewhat related subject of hysteria, is by James Hendrie Lloyd. The fact that hysteria is a morbid entity is emphatically insisted upon by the author, whose article reflects exhaustively the modern views of neurolo-

gists as to the etiology, symptomatology, and treatment of this affection. Of the pathology he says, "It is among the unsolved problems of the infant science of psychology."

Nervous Affections following Railway and other Injuries is the title of Chapter IV., written by Philip Coombs Knopp, whose extensive and careful studies in this field eminently qualified him for the work, a fact attested by the clearness and judicial fairness with which the subject has been dealt with. E. D. Fisher writes upon various diathetic and toxic affections of the nervous system, including those met with as complications in rheumatism, gout, and uræmia and those dependent upon alcoholism, morphine, cocaine, chloral, lead, arsenic, and mercury. Hardly sufficient relative importance is given to alcohol and morphia, especially to the clinical manifestations of these agents in nervous disease induced thereby. Dr. Fisher's modest disinclination to trespass upon the territory of others has led him to deprive us of much that is of value in his larger experience with these types. Cerebro-spinal meningitis, tetanus, tetany, hydrophobia, and diphtheritic paralysis are included in Chapter VI., contributed by William Osler. The recent epidemic of cerebro-spinal meningitis at Lonaconing, Maryland, afforded much new and valuable material to the author. Hydrophobia as a distinct morbid entity is admitted without qualification, and the method of preventive inoculation based upon Pasteur's teachings and conclusions is advocated. In the article upon diphtheritic paralysis it is with some surprise that I note the author's failure to mention the remarkable and almost specific action of strychnine, in sufficiently large doses, in the paragraph on treatment. Functional tremors, paralysis agitans, and epilepsy are treated by Landon Carter Gray. All these papers are written in the clear and forceful style which has made the author a teacher of such wide popularity. It is, however, in the paper upon epilepsy, a most familiar subject, that Dr. Gray appears most interesting and instructive. States of arrested development, malformations, and abnormalities of development and hydrocephalus are enumerated and graphically described by N. E. Brill in the succeeding chapter, which contains much unique and curious information, not exhaustively presented, but sufficiently full for the demands of such a work. Dr. Dercum, who, by the way, is much more than an ornamental editor, writes the chapter upon general diseases of the brain, including pachy- and lepto-meningitis, diseases of the sinuses, and cerebral abscess.

Chapter XIV., upon the anatomy of the cortex and cerebral localization, is the gem of the entire volume. The writer, Dr. Mills, has succeeded to an eminently brilliant degree, in presenting an intricately complex and difficult subject with a clearness, accuracy, and literary finish which leave no room for other than favorable criticism, except perhaps in the single subject of localization for common sensation. Dr. Dana writes the succeeding chapter, upon cerebral hemorrhage, embolism, and thrombosis. His well-known and widely-read papers upon these subjects, appropriately condensed and profusely illustrated, constitute the material of this paper, which is a sufficient criticism as to its excellence.

Chapter XVII. is upon brain tumors, and here again the editor has shown a fortunate judgment in the selection of Dr. M. Allen Starr. A conspicuously valuable feature of this paper is a table of operative results brought up to date, and the most complete, perhaps, ever published. Chapters XXII., XXIII., and XXIV., upon infantile hemiplegia, paretic dementia, and syphilis of the nervous system, are written by Dercum, whose editorial industry is equalled only by the excellence of his contributions. Chapters XVIII. and XIX., upon general and systemic affections of the spinal cord, are by Lloyd and Morton Prince. Both chapters are headed with an array of subtitles which are rather appalling in number and confusing in their apparent lack of relation, but a study of the text relieves the reader of embarrassment from both sources.

The greater portion of the volume which relates to the systemic and other affec-

tions of the spinal cord has been written by Dr. F. Peterson. In his paper upon the structure and functions of the spinal cord with localization, the subject has been presented clearly and with a just appreciation of the importance of emphasizing its clinical aspect. In the succeeding papers upon locomotor ataxia, bulbar paralysis, and disseminated sclerosis, the author appears to best advantage in a discussion of the pathology involved and the symptomatology, while the subject of diagnosis, most important, perhaps, to the practitioner, is lacking in fulness and clearness.

Wharton Sinkler writes Chapter XXV., which includes various forms of disease of the peripheral nerves, a very important and, in many respects, a comparatively new field in neurology. Diseases of the cranial nerves are treated in two chapters, XXVI. and XXVII., edited by Drs. De Schweinitz and C. Herter respectively. The latter, in discussing surgical measures for the relief of painful affections of the fifth, is entirely too optimistic in his views as to the dangers from Hortley's and other similar operations for the removal of the Gasserian ganglion, as such dangers are indicated by the tables published in the recent work of Chippault. Dr. Herter also writes the following paper upon diseases of the spinal nerves and their plexuses. The affections of the muscles which are of neural or cerebro-spinal origin are described in Chapter XXIX., by Dr. Jacoby, who also contributes the last chapter, upon neuro-electro-therapeutics, both ably and entertainingly written. Joseph Collins, under the title Tropho-Neuroses, writes of acromegaly, angio-neurotic œdema, scleroderma, and Raynaud's disease, quoting an abundant literature, reflecting the most recent and generally accepted views as regards etiology, pathology, and treatment. A graceful and finished literary art adds much to the charm of this paper. The Tropho-Neurosis associated with Pathological Changes in the Thyroid Gland (hardly a legitimate basis for separate consideration) is the title of Chapter XXXI., by Dr. Burr. Under this title he discusses the phenomena of myxœdema, cretinism, and exophthalmic goitre, bringing these up to date. Dr. J. C. Wilson's large personal experience has served a valuable end in affording him the material for the chapter on symptomatic disorders, including insomnia, vertigo, headache, and migraine. His therapeutic suggestions are marked by a peculiarly happy conservatism and value. Chapter XXXIII. deals with surgical procedures indicated in various cerebral, spinal, and neural affections, especially epilepsy, hydro- and microcephalus, tumors, abscess, and meningitis. No happier selection has been shown throughout the entire book than in assigning this chapter to Professor Keen, whose work in this field marks an epoch in American medicine, and is in fact recognized as authoritative throughout the medical world. His reputation has not suffered any loss in this his latest contribution to neurological surgery.

It would be unjust not to refer with due appreciation to the excellence of the work which the publishers have given to this volume. The print is clear and large; I did not note a single typographical error; the illustrations are up to the highest standard; the binding is both durable and æsthetic, and when it is considered how important the rôle of publisher is, in the attainment of success or failure by a new candidate for favor before the reading medical public, those who will see this book will readily appreciate this tribute to their skill. W. B. Pritchard.

A Treatise on Nervous and Mental Diseases. By Landon Carter Gray, M.D., Professor of Diseases of the Mind and Nervous System in the New York Polyclinic. Second Edition. 8vo, pp. 728. One hundred and seventy-two engravings and three colored plates. Philadelphia: Lea Brothers & Co. Cloth, $4.75; leather, $5.75.

In the second edition of this work many improvements are noted. The anatomical introduction has been entirely rewritten, so as to accord with the latest researches. Thirty-six papers have also been added to the section on mental diseases. On the other hand, the author has done well to withdraw some of the illus-

trations, notably one denominated " acromegaly," but more evidently myxœdema. In this edition the thyroid treatment of myxœdema is given its proper place, and regarding the preparation of the glands the author states that the alcoholic extract can easily be made from the fresh glands, and that it is not at all necessary to keep the extract any longer than is needful for the making, any more than in the case of any other extract, contrary to what certain interested persons would have us believe. Dr. Gray speaks of the advantages of a warm and equable temperature for such patients, and advocates the regular removal in the winter to Southern climates.

The tenth chapter is devoted to "Nervous Diseases of probably Microbic Origin,"—to wit, tetanus and tetany, hydrophobia or rabies, and diphtheritic paralysis. It strikes us as rather a short list. We did not think that any one had any further doubt as to the microbic origin of tetanus. The tendency is to include several other diseases in this category. The author does not commit himself, however, to a belief even in the infectious nature of anterior poliomyelitis. One cannot read the accounts of the recent extensive epidemic of infantile paralysis at Rutland, Vermont, and other epidemics in France and Sweden without being impressed with the immense probability of its infectious nature, notwithstanding the fact that the microbe has not yet been demonstrated. Men like Grawitz, Dana, Putnam, and Welch have come out boldly in favor of the toxic or microbic origin of a number of these diseases. Our belief is that poliomyelitis, multiple neuritis in certain forms, leprous neuritis, cerebro-spinal meningitis, in cases of which the micrococcus lanceolatus has been observed, are all, either directly or indirectly, of microbic origin.

In his description of multiple neuritis the author notes its toxæmic and infectious nature, and gives an excellent description of kakké, but does not use the term even in the glossary in the appendix. His directions as to treatment are admirable, as, indeed, they are all through the work, and cannot fail to impress one as the fruit of a very wide personal experience. Dr. Gray has observed a very curious fact with regard to the treatment of multiple neuritis to which we have never seen attention called elsewhere. In several of his patients in whom the pain could not be controlled, and in whom the disease was progressing, removal from the locality in which they had been attacked to another place would often effect a marvellous change. If there is an acute malarial history, quinine or Warburg's tincture, should be used in sufficient doses. In alcoholic cases it is recommended that quinine be used gradually in place of alcohol, and should cinchonism result, the conjoined use of bromide of potassium will be of benefit. Later on, massage will be of benefit when gently applied.

Regarding epilepsy, much valuable and interesting information is afforded. Rejecting all notions as to vasomotor changes in the cerebral circulation, the author holds that epileptic manifestations are due to a peculiar molecular condition of the motor tract, which runs from the motor convolutions to the peripheral motor structures and muscles. Of what this condition is we shall probably remain in ignorance, until, in the ripeness of time, we shall possess such instruments of precision as will enable us to see the molecular play in the living brain and spinal cord. Dr. Gray calls no case cured until five years have elapsed without a return of the convulsion, and states that he has never yet seen a case of *petit mal* materially affected by treatment except in those who suffer from malnutrition or where the attacks are due to the formation of ptomaines from an acute indigestion. The first place among remedies is given to the bromides.

Regarding syringomyelia the author has not modified his conservative position very much, saying that "it is now quite a fashion in this country to report so-called cases of syringomyelitis. Very few ante-mortem diagnoses have been made, however, although recently Dercum has reported a brilliant one." As a matter of fact, Sinkler and Lloyd have both made such diagnoses, and verified them at autopsies and published their cases. Schultze, Kahler and Pick, Critzmann, and others have made diagnoses and verified them in a similar manner.

Five new chapters on insanity have been added in the second edition. Dr. Gray believes in home treatment in all curable cases where sufficient means are available. His reasons are that realization of the fact that the patient is in a lunatic asylum is a great blow to the sufferer; that the nurses in such institutions are never so efficient as the trained nurses we can command outside; that the stigma of having been in an asylum is of itself a serious misfortune, and that the stage of convalescence cannot fail to be retarded by the constant contact with lunatics. These are weighty reasons, and coming from an alienist of Dr. Gray's reputation and practical experience must command thoughtful attention. The great question, how our hospitals for the insane can be improved in all these respects, has of late attracted widespread consideration. Existing methods of hospital management have been arraigned. In consequence of all the criticism and friendly suggestion by outside practitioners, there is gradually coming to light a more energetic and scientific management of the insane. The resident medical officers and the boards of managers cannot be oblivious to the points of weakness that have been pointed out by such men as Mitchell and Gray, and it is with great satisfaction that we see in various quarters indications that a brighter day is dawning for the curable insane.

We cannot leave Dr. Gray's book without commending his glossary and enlarged index, and expressing the pleasure which we have had in reading his interesting treatise, the fruit of personal experience. G. H.

Annual of the Universal Medical Sciences. A Yearly Report of the Progress of the General Sanitary Sciences throughout the world. Edited by Charles E. Sajous, M.D., and Seventy Associate Editors, assisted by over two hundred Corresponding Editors, Collaborators, and Correspondents. Illustrated with Chromo-lithographs, Engravings, and Maps. In five volumes. The F. A. Davis Company, Philadelphia, New York, Chicago, 1895.

In looking over this, the eighth issue of the Annual, the reviewer is seized with admiration for the organizing power and executive ability of the editor, who has called to his aid a numerous corps of writers from many countries, whose independent contributions must have needed much supervision to prevent the frequent repetitions that are so apt to occur in a literary undertaking as minutely subdivided as the Annual is.

Reference books of the type of the Annual have a distinct and indisputable value in our productive age, when literature in every branch of medicine is accumulating with a rapidity that is truly appalling to any one honestly endeavoring to keep abreast with contemporaneous progress. It is a source of considerable comfort to have within reach a compilation, in the form of short abstracts, of the most important contributions to medicine within a given period. The Annual, although it contains some unimportant matter that is scarcely worthy of incorporation, presents a good *résumé* of medical progress, and will be found a useful addition to the physician's library, one to which he will have frequent recourse. D. R.

BOOKS RECEIVED.

J. B. LIPPINCOTT COMPANY, Philadelphia.

Da Costa's Medical Diagnosis. Eighth Edition. Revised.

Pediatrics; the Hygienic and Medical Treatment of Children. By Thomas Morgan Rotch, M.D., Professor of the Diseases of Children, Harvard University. Illustrated.

WILLIAM WOOD & CO., New York.

The Medical Record Visiting-List and Physician's Diary for 1896. New Revised Edition, with Calendar, Tables of Doses, Tables of Equivalents, Directions for Emergencies, Antisepsis, Disinfection, Special Memoranda, Cash Account, etc., etc. Thirty and sixty patients per week. $1.25 and $1.50.

W. B. SAUNDERS, Philadelphia.

An American Text-Book of Obstetrics. By James C. Cameron, M.D., Edward P. Davis, M.D., Robert L. Dickinson, M.D., Charles Warrington Earle, M.D., James H. Etheridge, M.D., Henry J. Garrigues, M.D., Barton Cooke Hirst, M.D., Charles Jewett, M.D., Howard A. Kelly, M.D., Richard C. Norris, M.D., Chauncey D. Palmer, M.D., Theophilus Parvin, M.D., George A. Piersol, M.D., Edward Reynolds, M.D., and Henry Schwarz, M.D. Editor, Richard C. Norris, M.D.; Art Editor, Robert L. Dickinson, M.D. With nearly nine hundred colored and half-tone illustrations. Cloth, $7.00; sheep, $8.00. Pp. 1009. For sale by subscription only.

LEA BROTHERS & CO., Philadelphia.

Appendix to Dunglison's Medical Dictionary, Supplementing the copy of the Twenty-first Edition.

H. C. BODEN & CO., Philadelphia.

Students' Aid in Ophthalmology. By Gertrude A. Walker, A.B., M.D., Clinical Instructor in Diseases of the Eye in the Women's Medical College of Pennsylvania. With forty illustrations and one colored plate. 12mo. Pp. 183. Cloth, $1.50.

P. BLAKISTON, SON & CO., Philadelphia.

Van Harlingen's Hand-Book of the Diagnosis and Treatment of Skin-Diseases. Third Edition, enlarged and revised. Pp. 577. Cloth, $2.75.

Byford's Manual of Gynæcology. Illustrated. Pp. 488. Cloth, $2.50.

D. APPLETON & CO., New York.

The Principles and Practice of Medicine, Designed for the Use of Practitioners and Students of Medicine. By William Osler, M.D., Fellow of the Royal College of Physicians, London; Professor of Medicine in the Johns Hopkins University, and Physician-in-Chief to the Johns Hopkins Hospital, Baltimore; formerly Professor of the Institutes of Medicine, McGill University, Montreal; and Professor of Clinical Medicine in the University of Pennsylvania, Philadelphia. Second Edition.

F. A. DAVIS CO., Philadelphia.

Materia Medica and Therapeutics. A Practical Treatise, with Especial Reference to the Clinical Application of Drugs. By John V. Shoemaker, A.M., M.D., LL.D., Professor of Materia Medica, Pharmacology, Therapeutics, and Clinical Medicine, and Clinical Professor of Diseases of the Skin in the Medico-Chirurgical College of Philadelphia; Physician to the Medico-Chirurgical Hospital, Philadelphia, etc., etc. Third Edition, thoroughly revised. 8vo. Pp. 1108. Extra cloth, $5.00; sheep, $5.75.

Pregnancy, Labor, and the Puerperal State. By Egbert H. Grandin, M.D., Consulting Surgeon to the New York Maternity Hospital; Consulting Gynæcologist to the French Hospital, New York, etc.; and George W. Jarman, M.D., Obstetric Surgeon to the New York Maternity Hospital; Gynæcologist

to the Cancer Hospital, New York, etc. Illustrated with forty-one original full-page photographic plates. 8vo. Pp. 261. Cloth, $2.50.

TRANSACTIONS.

TRANSACTIONS OF THE MICHIGAN STATE MEDICAL SOCIETY FOR THE YEAR 1895. Vol. xix. Publication committee, Drs. C. W. Hitchcock, J. B. Whinery, A. P. Biddle, A. E. Bulson, and C. H. Johnston.

ITEMS OF INTEREST.

THE colored citizens of Philadelphia have exerted themselves to establish a school in which young colored women can be trained in the important branch of practical medicine, nursing. In order to have material with which to illustrate the principles and practice of nursing, those interested in the establishment of this school have opened a hospital for colored people in connection with the training school. The managers have taken a lease of a three-story house on Lombard Street above Fifteenth, and have knocked out partitions so as to make a ward in the second and a ward in the third story. These wards hold nine beds; that in the second story is to be devoted to the care of women patients, and that in the third story is to be devoted to the care of male patients. In addition to the ward, the second floor contains an operating-room, with a room immediately adjoining which can be used for operation cases or for private patients. This floor also has a toilet-room. On the third floor, besides the ward, are to be found the resident physician's room, the nurses' dormitory, and another toilet. The first floor is devoted to administrative offices and kitchen, and the basement is occupied by rooms for an out-patient department and a laundry. The medical staff is as follows: Consulting Surgeons, John B. Deaver, M.D., and Thomas S. K. Morton, M.D.; Consulting Physicians, James Tyson, M.D., and Roland G. Curtin, M.D.; Consulting Gynæcologists, B. F. Baer, M.D., and Hannah T. Croasdale, M.D.; Attending Surgeons, J. P. Tunis, M.D., N. F. Mossell, M.D., and J. Thomas Stanford, M.D., Assistant; Attending Physicians, E. C. Howard, M.D., and William H. Warrick, M.D.; Attending Gynæcologists, Caroline V. Anderson, M.D., and Theo. A. Erck, M.D., and George R. Hilton, M.D., and D. W. Ogden, M.D., Assistants; Obstetrics and Diseases of Children, James T. Potter, M.D.; Ophthalmologist, H. F. Hansell, M.D.; Pathologist, A. A. Stevens, M.D.; Dermatologist, J. Abbott Cantrell, M.D.; Dental Surgeon, William A. Jackson, D.D.S.; Pharmacist, Henry M. Minton, Ph.G. A resident physician is to be appointed. Ten of these gentlemen are colored men. The

The Frederick Douglass Memorial Hospital.

training-school will be in charge of Miss Minnie M. Clemens, a young colored woman, who received her training at the Hospital of the University of Pennsylvania. It is proposed to have three resident nurses, and to run the number in the class up to twelve, the pupil nurses who do not live in the hospital to have rooms in the neighborhood.

Shall Women be admitted to the College of Physicians in England?

At an extraordinary meeting of the College of Physicians of England, held October 24, 1895, the question of the admission of women to the diplomas of the college was the subject of an earnest and interesting discussion. The admission was opposed by Charles West, Sir Joseph Fayrer, Hare, Barnes, Douglas Powell, Sir R. Quain, Sir William Jenner, and the president of the college, Sir J. Russell Reynolds, the last stating that, in his opinion, women were physically, mentally, and morally unfitted for the practice of medicine. The cause of the women was advocated by Sir B. W. Richardson, Sir W. Broadbent, and Dr. Payne. At the end of the discussion a division was taken with the following result: for admission, 50; against, 59; majority, 9. At a similar meeting held eighteen years ago, the request of the women for admission was rejected by 68 votes to 18.

The Close Relations existing between the Physician and the Scientist in Germany.

The causes which have raised German medical science to its present undisputed pre-eminence have been frequently discussed in print, but one factor, it seems, has either been entirely overlooked, or, if mentioned, has not received proper appreciation. We refer to the close and fraternal affiliation of the German physician and the German scientist. The physician meets in annual convention the physicist, the chemist, the zoologist, the botanist, and the mathematician, and is made aware of the discoveries in their branches; he has brought before him the results of patient and thorough scientific method, and is of necessity inspired to follow an example set by the greatest minds of his nation. At the recent congress in Lübeck (*Die 67. Versammlung der deutscher Naturforscher und Aertze*) several brilliant and lofty addresses were delivered at the general meetings, at which physician and scientist met in a spirit of brotherhood.

We have not space to discuss the addresses of the electro-chemist Ostwald, who spoke on "The triumph over scientific materialism," of Victor Meyer, who espoused with powerful arguments the atomic theory, and detailed his pyrothermic experiments on the ultimate constitution of the elements, or of Rindfleisch, who in his lecture on "Neovitalismus," took refuge in the teleagic idea to explain the phenomena of life, or rather life

itself. Unquestionably the effect of hearing such philosophic addresses is to ennoble and to inspire. We would fain see American medicine form an integral part of American science.

Absence of the Rectum.

Mr. W. M. Woodhouse[1] has recently reported a case of congenital absence of the rectum, the malformation escaping discovery for three days. No similar case has occurred in nearly two thousand births in the Kensington Infirmary, and only one case of imperforate anus is there recorded. We recall once making a post-mortem upon a case of absence of the rectum for Dr. B. C. Hirst, in which the nurse was supposed to have given a glycerin suppository on several occasions, and by this means to have obtained a fæcal passage from the child!

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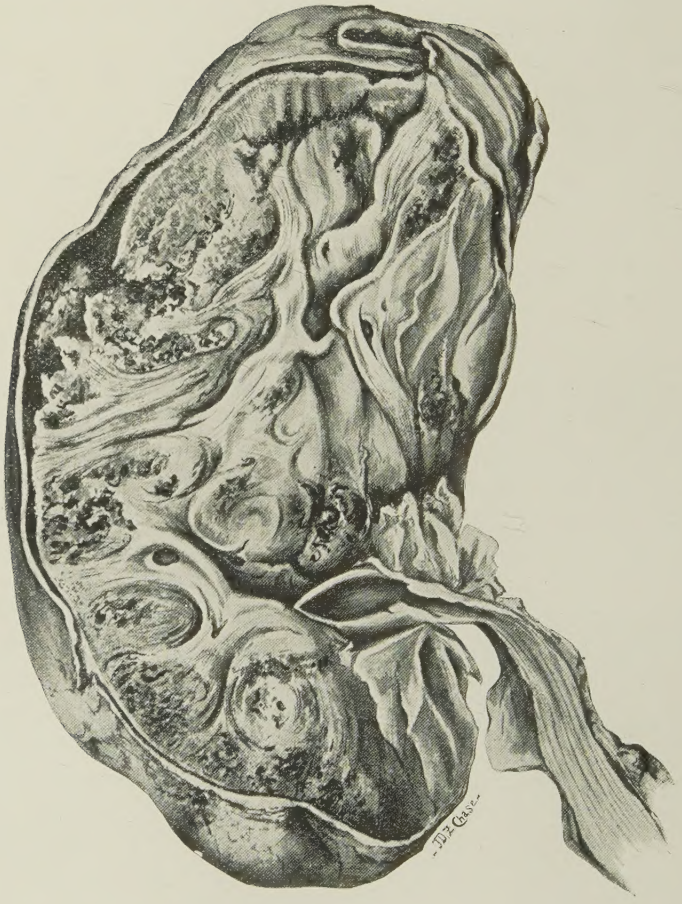
[1] Lancet, September 21, 1895.

PLATE I.



See report of autopsy of Case I.